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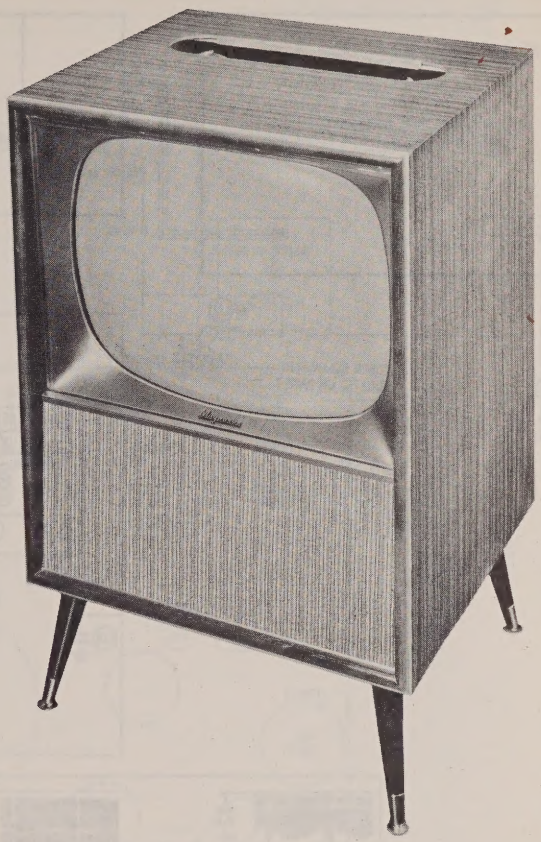
PHOTOFACT* Folder

*TRADE MARK

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

MAGNAVOX CHASSIS U24-01AA, U24-02AA, U24-03AA, U24-04AA, U24-06AA, V24-01AA, V24-02AA, V24-03AA, V24-04AA, V24-06AA (24 Series)

MAGNAVOX CHASSIS U24-01AA, U24-02AA, U24-03AA, U24-04AA, U24-06AA, V24-01AA, V24-02AA, V24-03AA, V24-04AA, V24-06AA (24 Series)



DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 8 push-on type knobs from the top.
2. Remove 6 wood screws from the rear cover. Remove the rear cover.
3. Remove 2 wood screws holding the metal braces to the cabinet.
4. Remove the speaker leads.
5. Remove 6 bolts holding the chassis mounting board.
6. Remove the mounting board and chassis.

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TRADE NAME	Magnavox	CHASSIS
		U24-01AA, U24-02AA, U24-03AA, U24-04AA, U24-06AA V24-01AA, V24-02AA, V24-03AA, V24-04AA, V24-06AA (24 Series)
MANUFACTURER	Magnavox Co., 2131 Bueter Road, Fort Wayne 4, Indiana	
TYPE SET	Television Receiver	
TUBES	Eighteen	
POWER SUPPLY	110-120 Volts AC, 60 Cycle	RATING 180 Watts, 1.6 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF,	Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of the VHF oscillator is possible by removing the rear cover and suppling power to the set. Set the fine tuning at the center of its range. The adjustments are accessible, one at a time, as the channel selector is rotated through a hole in the tuner rear cover.

PICTURE TUBE SAFETY GLASS CLEANING

Remove the 4 wood screws holding the trim strip at the top of the safety glass. Tilt the glass out at the top and lift up to remove.

FOCUS

The focus may be varied by the position of a strap on the base of the picture tube. The strap can be connected between pins 6 and 10 or 6 and 2. NOTE: Some versions may use an ion trap. If so equipped readjust ion trap for best focus consistent with maximum brightness.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

For adjustment of the horizontal oscillator , it is necessary to remove the rear cover and supply power to set. Set the horizontal hold at the center of its range and adjust the horizontal frequency slug (B1) until the picture synchronizes horizontally. (For location,see tube placement chart).

FUSES

One fuse is used for LV power supply protection. (For location, see tube placement chart).

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1958 Howard W. Sams & Co., Inc., Indianapolis 5, Indiana . Printed in U.S. of America

H377

FOLDER 1

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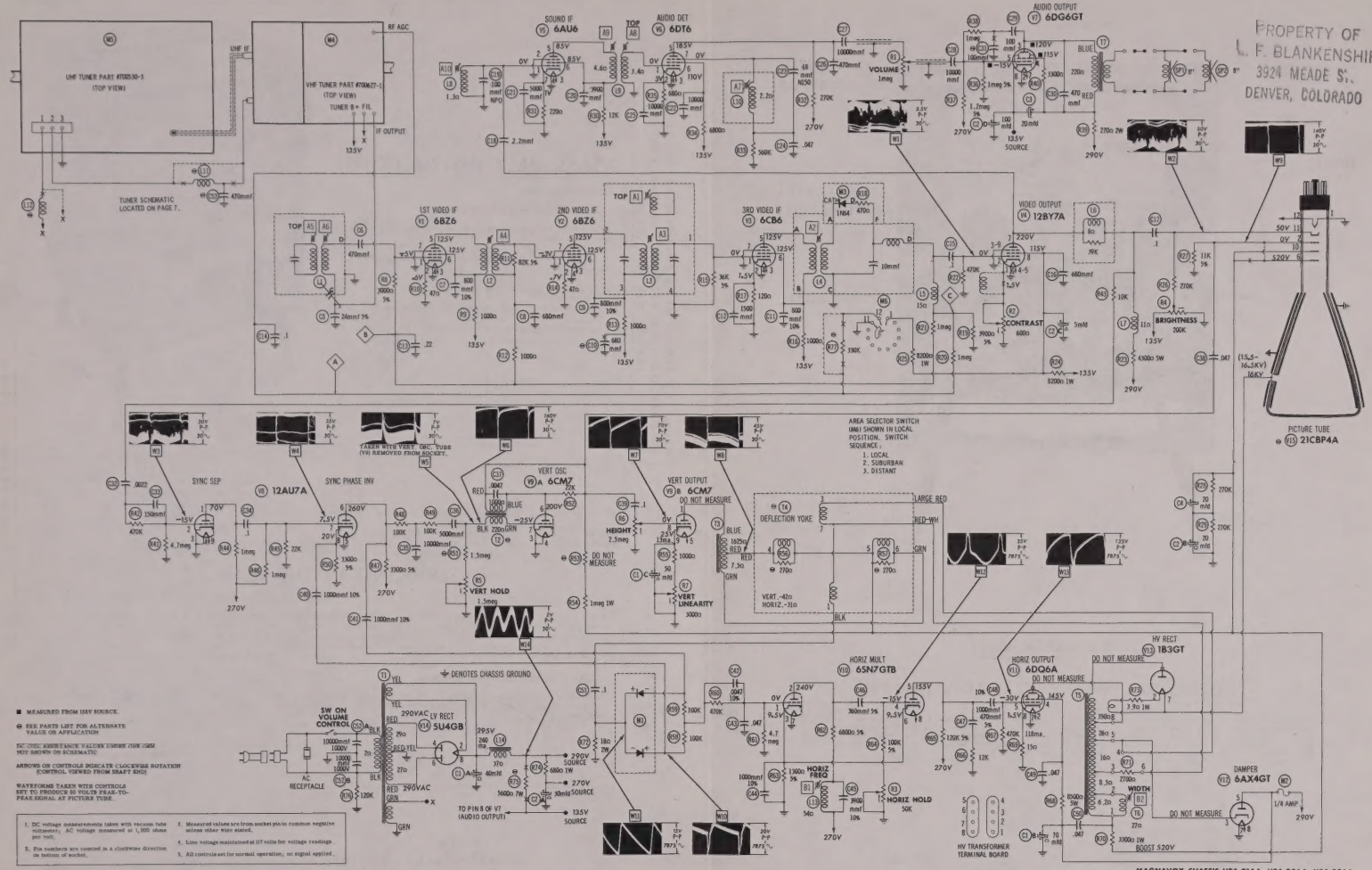

■ MEASURED FROM 135V SOURCE.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)

WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 50 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE.

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltage measured as 1,000 ohms per volt.
2. Pin numbers are counted in a clockwise direction on bottom of socket.
3. Measured values are from socket pin to common negative unless other wise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation; no signal applied.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

MAGNAVOX CHASSIS U24-01AA, U24-02AA, U24-03AA, U24-04AA, U24-06AA, V24-01AA, V24-02AA, V24-03AA, V24-04AA, V24-06AA (24 Series)

FOLDER 1

TUBE PLACEMENT CHART

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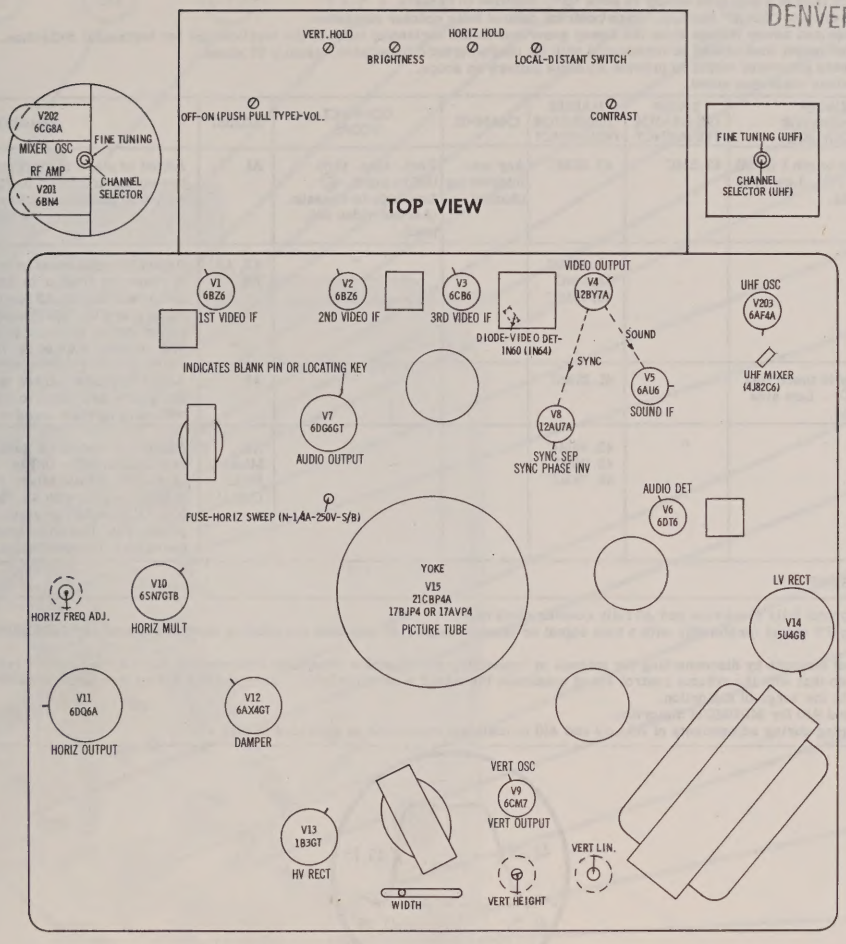


TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - **V14**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V1, V2, V3, Diode (M3), V4, V7**
No pic, no sound, has snow - **V201, V202, V1, V7 (V203 UHF only)**
No pic, has sound, has raster - **V4, V15, V7**
Has pic, no sound - **V5, V6, V7**

SYNC FAILURE
No vert. sync - **V8**
No horiz. sync - **V8, Rectifier (M1)**
No vert. or horiz. sync - **V8**

SWEEP FAILURE
No raster, has sound - **Fuse (M2), M1, V10, V11, V12, V13, V15**
No vertical deflection - **V9**
Poor vert. linearity or foldover - **V9**
Poor horiz. linearity or foldover - **V10, V11, V12**
Narrow picture - **V10, V11, V12, V14**
Vert. off freq. - **V9**
Horiz. off freq. - **V10**

MAGNAVOX CHASSIS U24-01AA, U24-02AA, U24-03AA, U24-04AA, U24-06AA, V24-01AA, V24-02AA, V24-03AA, V24-04AA, V24-06AA (24 Series)

FOLDER 1

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

The high voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.

VIDEO IF ALIGNMENT

Connect the negative lead of a 1.5 volt bias supply to point Ⓐ . Positive to chassis.
Connect the negative lead of 3 volt bias supply to point Ⓑ . Positive to chassis.
Set Local-Distant switch to "Local" position. Turn contrast control fully counter clockwise.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.001mfd	High side to pin 1 (grid) of 6BZ6 (V1). Low side to chassis.	43.5MC	47.25MC	Any non-interfering channel	Vert. amp. thru 10K to point Ⓒ . Low side to chassis. (Across video det. load).	A1	Adjust to place marker in trap notch. If two points are found to do this, use the one with slug farthest counter clockwise.
2.	"	"	"	42.25MC 45.0MC 45.75MC	"	"	A2, A3, A4	Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown. Adjust A2 for maximum gain, A3 to place 45.75MC marker at 50% on curve and A4 to place 42.25MC marker at 50% on other side of curve. Recheck step 1.
3.	"	High side to tuner test point Ⓓ . Low side to chassis.	"	41.25MC	"	"	A5	Adjust to place marker in trap notch. If two points are found to do this, use the one with slug farthest counter clockwise.
4.	"	"	"	42.25MC 45.0MC 45.75MC	"	"	A6, Mixer Plate Coil	Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown. Adjust Mixer Plate Coil for maximum gain with 45.75MC marker at 50%. Adjust A6 for maximum gain and proper tilt. Due to interaction it may be necessary to repeat adjustment.

SOUND IF ALIGNMENT

1. Turn contrast control fully clockwise and A7 fully counter clockwise.
2. Tune in a strong TV signal (preferably with a tone signal or music). Adjust A7 just past the point of maximum sound and MINIMUM distortion.
3. Reduce the signal strength by disconnecting the antenna or connecting an adjustable attenuator between the antenna lead and the receiver antenna terminals so that with the volume control set at maximum the sound is at a low level. Tune the fine tuning thru undistorted sound. Set the fine tuning to the verge of distortion.
4. Adjust A8, A9 and A10 for MINIMUM distortion.
5. Readjust fine tuning during adjustments of A8, A9 and A10 to maintain conditions as indicated in step 3.

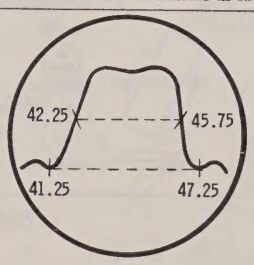
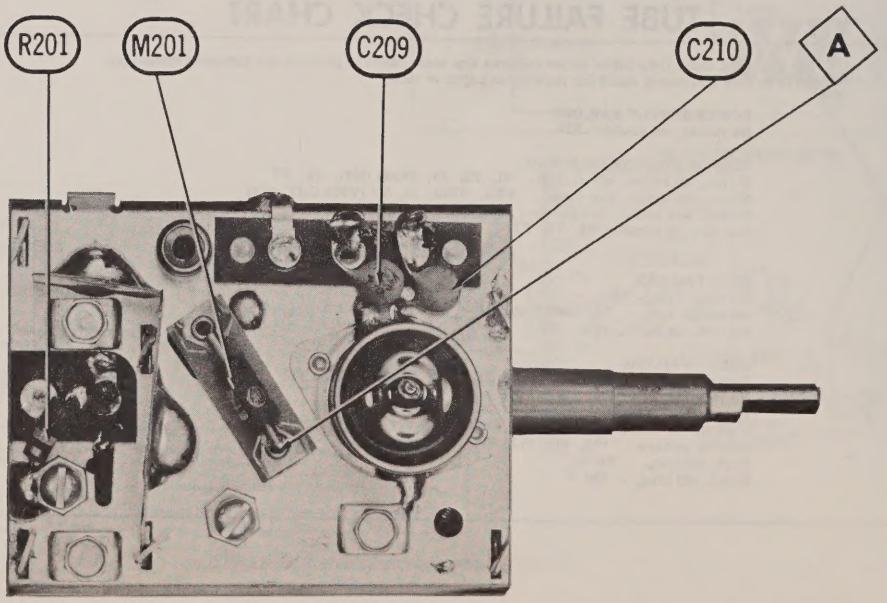


FIG. 1



UHF TUNER TOP VIEW

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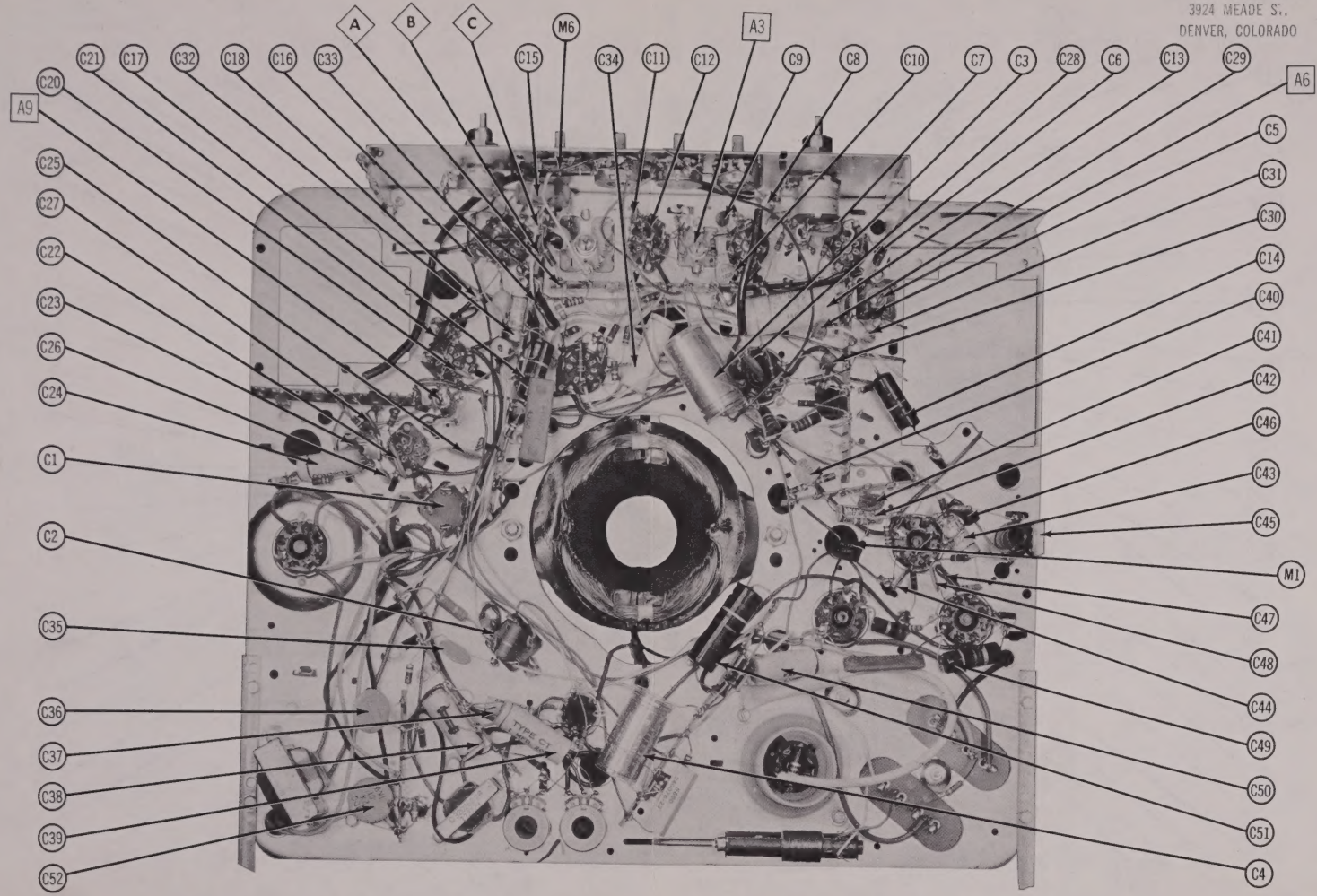

CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

U24-04AA, U24-06AA, V24-01AA, V24-02AA, V24-03AA, V24-04AA, V24-06AA (24 Series)

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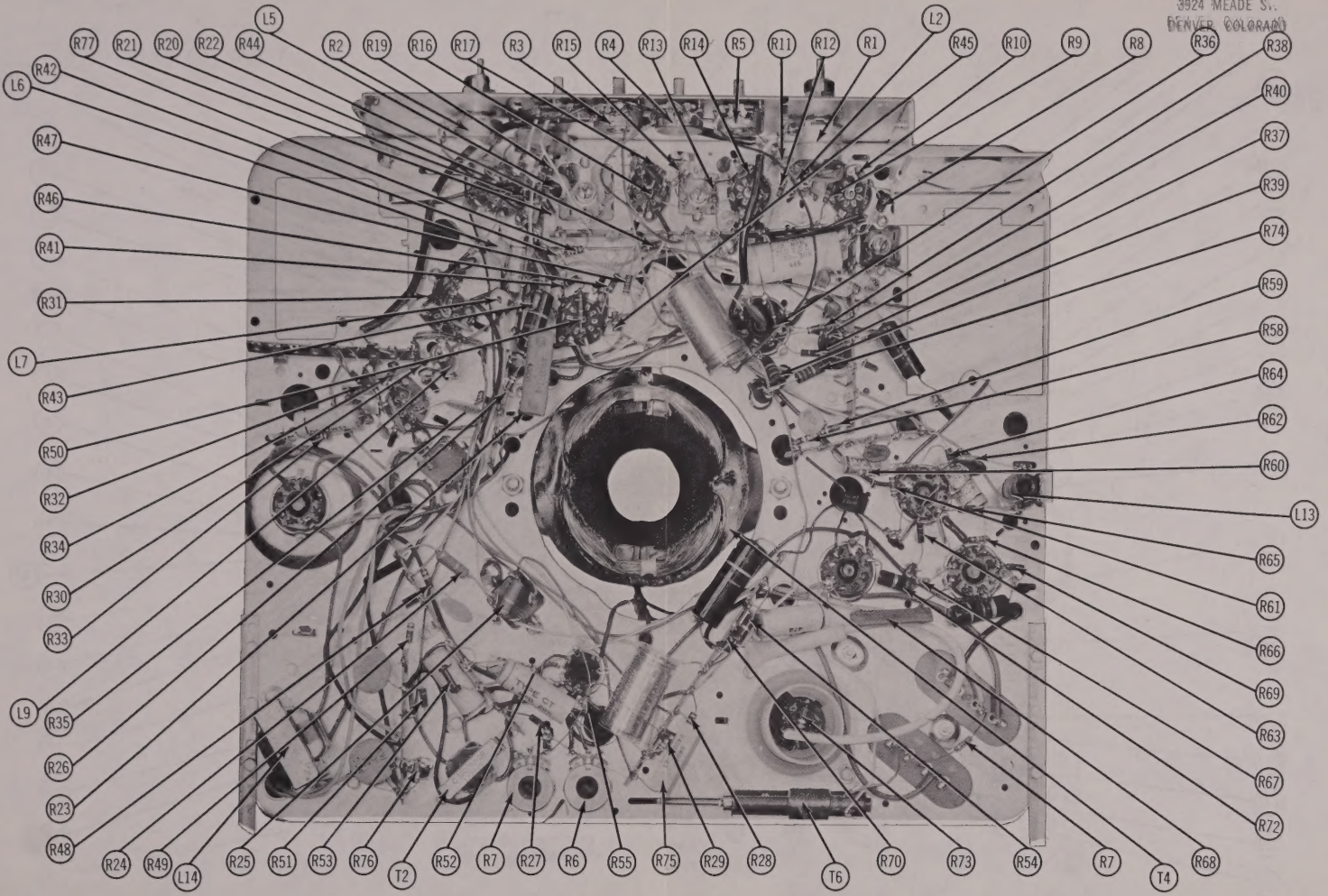
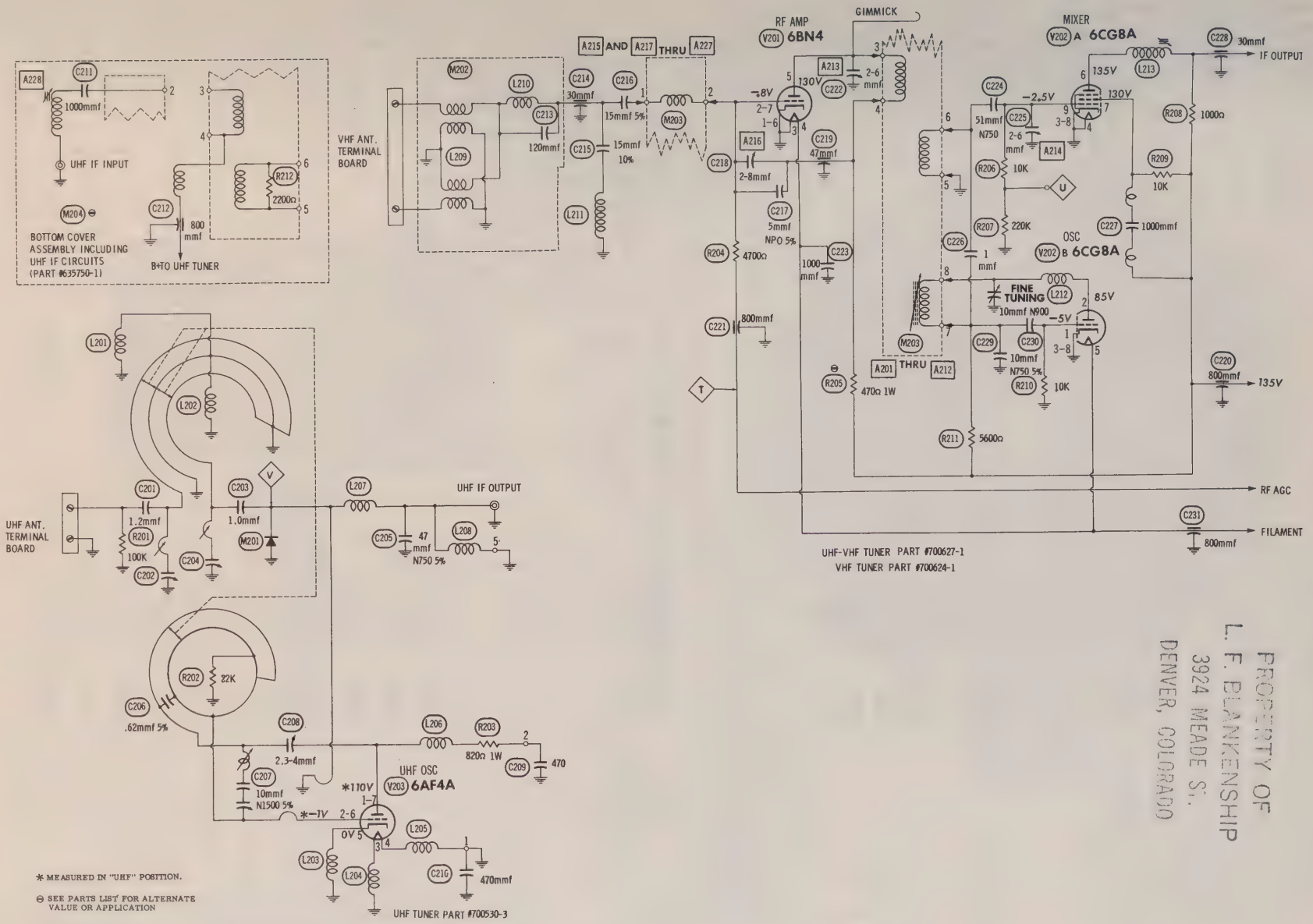


CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

MAGNAVOX CHASSIS U24-01AA, U24-02AA, U24-03AA, U24-04AA, U24-06AA, V24-01AA, V24-02AA, V24-03AA, V24-04AA, V24-06AA (24 Series)

FOLDER 1



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TUNER SCHEMATIC

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U24-04AA, U24-06AA, V24-01AA, V24-02AA, V24-03AA,
V24-04AA, V24-06AA (24 Series)

TUNER ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

Allow a 20 minute warm-up period for the receiver and test equipment.

VHF OSCILLATOR ALIGNMENT

Connect variable bias to IF AGC line. Adjust bias to obtain response curve which shows no indication of overloading.
Connect the negative lead of a 1.5 volt bias supply to point Ⓣ. Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning to the center of its range.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Set Local-Distant switch to "Local" and contrast control fully counter clockwise.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Fig. 201	Across antenna terminals thru network (Fig. 201).	213MC	211.25MC 215.75MC	13	Vert. Amp. thru 10K across video detector load.	A201	Adjust to place sound marker in trap notch as in Fig. 202. Video marker should fall at 50%.
			207MC	205.25MC 209.75MC	12		A202	
			201MC	199.25MC 203.75MC	11		A203	
			195MC	193.25MC 197.75MC	10		A204	
			189MC	187.25MC 191.75MC	9		A205	
			183MC	181.25MC 185.75MC	8		A206	
			177MC	175.25MC 179.75MC	7		A207	
			85MC	83.25MC 87.75MC	6		A208	
			79MC	77.25MC 81.75MC	5		A209	
			69MC	67.25MC 71.75MC	4		A210	
			63MC	61.25MC 65.75MC	3		A211	
			57MC	55.25MC 59.75MC	2		A212	

VHF RF AND MIXER ALIGNMENT

Connect the negative lead of a 2.5 volt bias supply to point Ⓣ. Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.
Antenna coils (A215 and A217 thru A227) are adjusted thru a rectangular hole on the opposite side of the tuner from the oscillator slug adjustments.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
2.	Fig. 201	Across VHF antenna terminals thru matching network (Fig. 201).	195MC	193.25MC 197.75MC	10	Vert. Amp. thru 10K to point U. Low side to chassis.	A213, A214, A215, A216	Connect a 22Ω ½ watt carbon resistor across the terminals of the channel 10 antenna coil (A215). Adjust A213 and A214 for a balanced response curve similar to Fig. 203. Remove 22Ω resistor from A215. Adjust A215 by expanding or compressing coil turns for maximum gain between markers with balanced peaks. If the valley is not centered between the two balanced peaks, remove the B plus to the tuner and adjust A216 with a non-metallic alignment tool until the valley is centered between peaks as in Fig. 204. Reconnect B plus to the tuner. Replace tuner shield on tuner.
3.	"	"	213MC	211.25MC 215.75MC	13	"	A217	Adjust for maximum gain and symmetry similar to Fig. 203.
4.	"	"	207MC	205.25MC 209.75MC	12	"	A218	"
5.	"	"	201MC	199.25MC 203.75MC	11	"	A219	"
6.	"	"	189MC	187.25MC 191.75MC	9	"	A220	"
7.	"	"	183MC	181.25MC 185.75MC	8	"	A221	"
8.	"	"	177MC	175.25MC 179.75MC	7	"	A222	"
9.	"	"	85MC	83.25MC 87.75MC	6	"	A223	"
10.	"	"	79MC	77.25MC 81.75MC	5	"	A224	"
11.	"	"	69MC	67.25MC 71.75MC	4	"	A225	"
12.	"	"	63MC	61.25MC 65.75MC	3	"	A226	"
13.	"	"	57MC	55.25MC 59.75MC	2	"	A227	"

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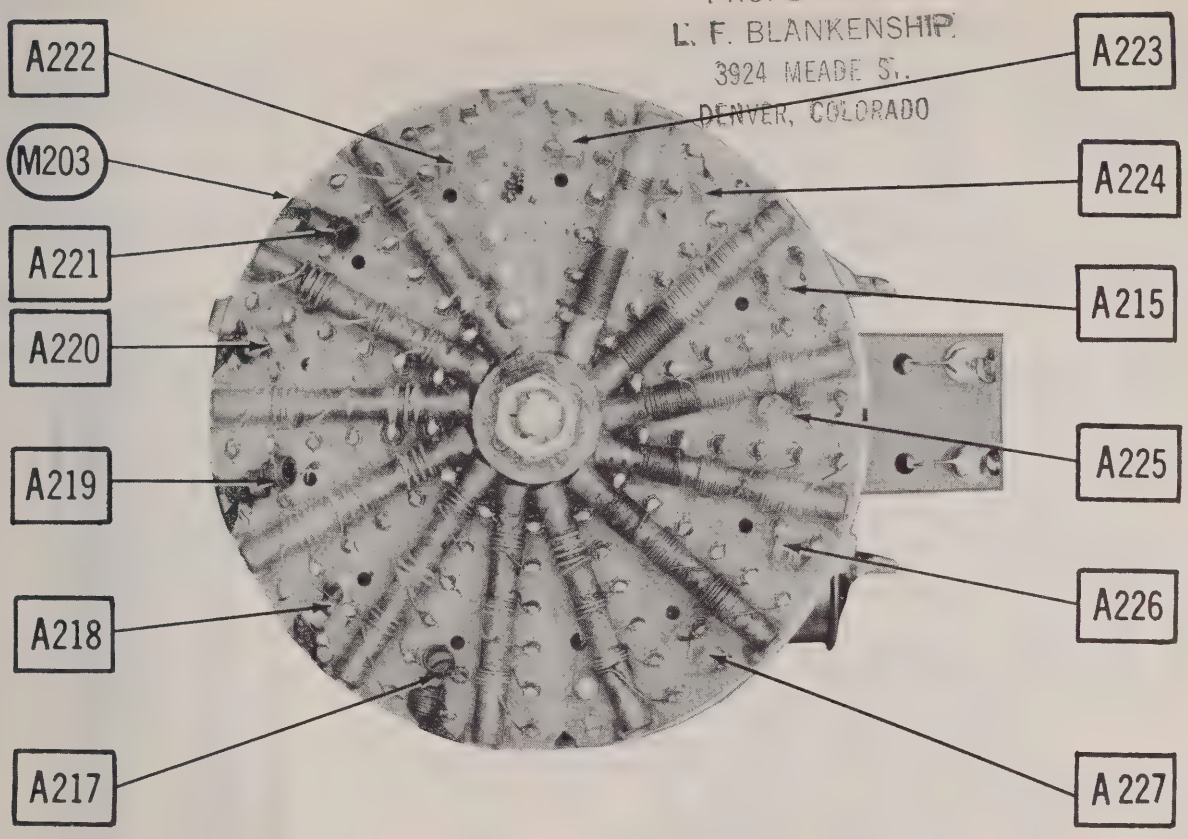
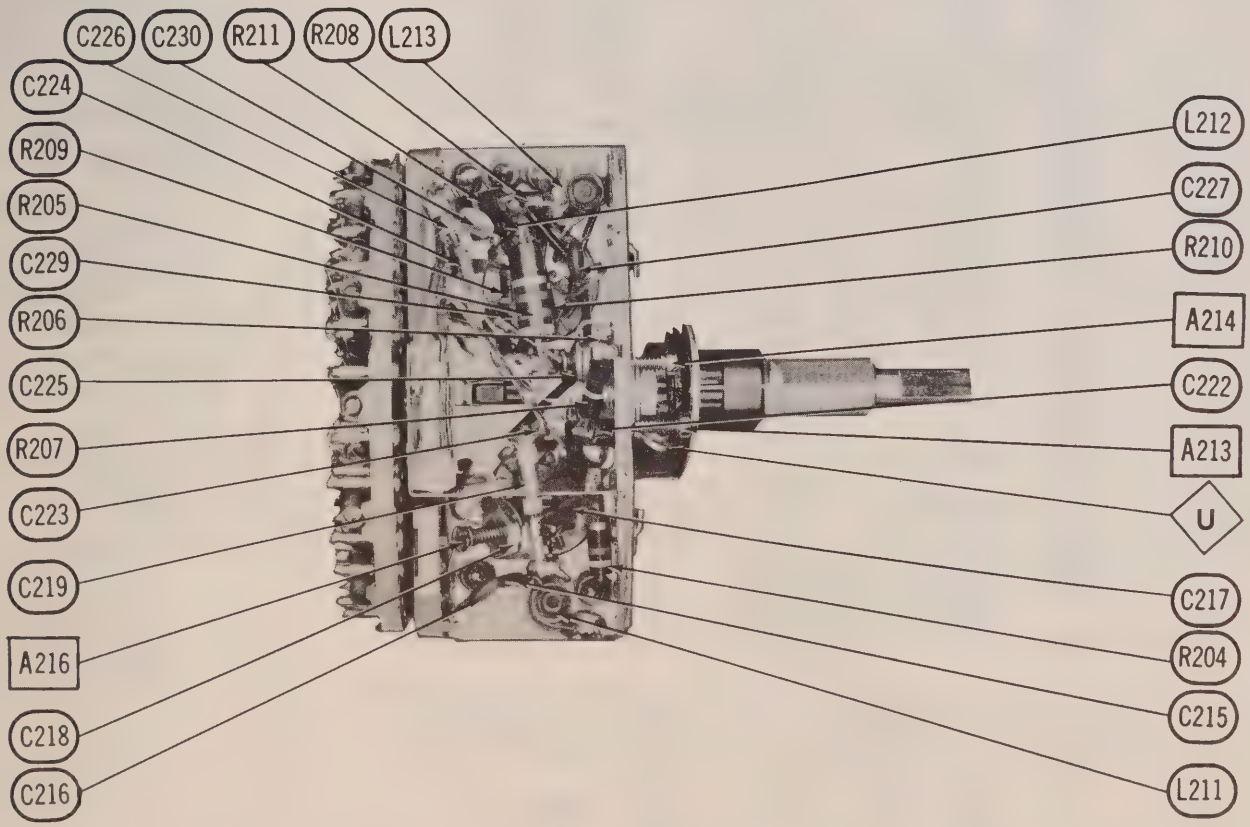


RF TUNER ROTARY ASSEMBLY



RF TUNER BOTTOM VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	1st Video IF Amp.	6BZ6	
V2	2nd. Video IF Amp.	6BZ6	
V3	3rd Video IF Amp.	6CB6	
V4	Video Output	12BY7A	
V5	Sound IF Amp	6AU8	
V6	Audio Det	6DT6	
V7	Audio Output	6JX8GT	
V8	Sync Sep -Sync Phase Inv	12AU7A	
V9	Vert. Osc. -Vert Output	6CM7	
V10	Horiz. Mult	6BN7GTB	
V11	Horiz. Output	6DQ6A	
V12	Damper	6AX4GT	
V13	HV Rectifier	1B3GT	
V14	LV Rectifier	5U4GB	

PICTURE TUBE

ITEM No.	REPLACEMENT DATA				NOTES
	MAGNAVOX PART No	GENERAL ELECTRIC PART No	RCA PART No	SYLVANIA PART No	
V15	21CB744		21CB744-A ①	21CB744	1 Silverama
				21CB744-A ②	2 Silver screen "66"
	21CB744		21CB744-A ②	21CB744/	3 Aluminized
				21CB744-A ③	
	17BJP4		17BJP4 ①	17BJP4 ②	
	17AVP44/	17AVP44/	17AVP44/	17AVP44/	
	17AVP44 ①	17AVP44 ①	17AVP44-A ①	17AVP44-A ③	
				17AVP44	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA							
	CAP.	VOLT.	MAGNAVOX PART No.	AEROVOX PART No.	CORNELL DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.	NOTES
C1A	40	350	270021-62	AF83-454-30	D0471	FP264 5	TMT-67	T-110		R2351 *
B	70	350				TC39	TD-30-350	MT-0550		
C	450	50								
C2A	30	350	270021-64	AF84-56-93.5	D0418	FP430 29		T-735	R2346 *	
B	30	350				TC85		MTD-4508		
C	45	350								
D	100	300								
C3	20	350	270037-30	PR8450V30	BR2035	TC85	TD-20-350	MT-4520	TVA-1608	
C4	20	350	270037-30	PR8450V30	BR2035	TC85	TD-20-350	MT-4520	TVA-1608	

* Non-catalog item.

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP	VOLT	MAGNAVOX PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C5	24		250236-315	1469-000024	TCZ-24		225SQ24	CY10C2404		MS-424	5%
C6	470		250218-6	BPD-00047	DD-471		BYA10T47	ED-470	UC-5347	MS-347	5GA-T47
C7	800		250218-14				1RS78			MS-38	10%
C8	680		250218-8	BPD-00068	DD-681		BYA10T68	ED-680	UC-5368	MS-368	5GA-T68
C9	800		250218-14				1RS78			MS-38	10%
C10	680		250218-6	BPD-00068	DD-681		BYA10T68	ED-680	UC-5368	MS-368	5GA-T68
C11	800		250218-14				1RS78			MS-38	10%
C12	1500		250218-18	BPD-0015	DD-152		BYA10D15	ED-1500	DCS215		5HK-D15
C13	32	200	250303-15	P28BN-22			CUB32P3		GEM-3033		2TM-P33
C14	1	200	250303-13	P28BN-1	DF-104		CUB2P1		GEM-201		2TM-P1
C15	1	200	250185-16	P28BN-1	DF-104		CUB2P1		GEM-201		2TM-P1
C16	680		250218-6	BPD-00068	DD-681		BYA10T68	ED-680	UC-5368		5GA-T68
C17	1	200	250303-13	P28BN-1	DF-104		CUB2P1		GEM-201		2TM-P1
C18	2.3		250231-18	NPO-01 2.3	TCZ-2R3		CUV2R3C	TCO- 2.3			STCC5-V22
C19	100		250175-59	NPO-01 100	TCZ-100		CUV10C	TCO-100		ZT-631	STCC-T1 NPO
C20	3900		250175-31	BPD-004	DD-392		BYA10D4	ED-004			5GA-D39
C21	5000		250175-1	BPD-005	DD-502		BYA10D5	ED-006	DCS25		5HK-D5
C22	10000		250218-19	BPD-01	DD-103		BYA6S1	ED-01	DCS1		5HK-S1
C23	18		250175-54								N150
C24	047	200	250303-11	P28BN-047	DD-503		CUB2S47		GEM-4147		2TM-S47
C25	10000		250218-19	BPD-01	DD-103		BYA6S1	ED-01	DCS1		5HK-S1
C26	470		250218-5	BPD-00047	DD-471		BYA10T47	ED-470	UC-5347		5GA-T47
C27	10000		250175-2	BPD-01	DD-103		BYA6S1	ED-01	DCS1		5HK-S1
C28	10000		250175-2	BPD-01	DD-103		BYA6S1	ED-01	DCS1		5HK-S1
C29	100		250218-22	BPD-0001	DD-101		L10T1	ED-100	UC-531		5GA-T1
C30	470		250218-5	BPD-00047	DD-471		BYA10T47	ED-470	UC-5347		5GA-T47
C31	100			BPD-0001	DD-101		L10T1	ED-100	UC-531		5GA-T1 ①
C32	0022	600	250211-3	P468N-0022	D6-223		CUB6D223	GP-2200	GEM-4223		6TM-D22
C33	150	600	250229-534	1468-00015	D6-151		5WYD15	ED-150	UC-5315		1FM-S15
C34	1	400	250211-1	P468N-1	DF-104		CUB4P1		GEM-401		4TM-P1
C35	10000		250218-19	BPD-01	DD-103		BYA6S1	ED-01	DCS1		5HK-S1
C36	5000		250218-13	BPD-005	DD-502		BYA10D5	ED-005	DCS25		5HK-D5
C37	0047	400	250211-5	P468N-0047	D6-473		CUB6D47	GP-4700	GHM-6347		6TM-D47
C38	047	400	250213-7	P468N-047	DF-503		CUB4S47		GEM-4147		4TM-S47
C39	1	400	250211-13	P468N-1	DF-104		CUB4P1		GEM-401		4TM-P1
C40	1000		250218-8				1RS01	ED-1000	MCB265	MS-31	10%
C41	1000		250218-8				1RS01	ED-1000	MCB265	MS-31	10%
C42	0047	400	250213-5						GEM-4147		10%
C43	047	200	250213-5	P28BN-047	DF-503		CUB2S47		GEM-4147	2TM-S47	
C44	1000		250218-8				1RS01	ED-1000		MS-31	10%
C45	1900		250228-468	1469-0039			1RS099			MS-339	10%
C46	380		250228-343	1469-00038			5RS736	CY15C381Y		MS-336	5%
C47	470		250228-346	1464-00047			5RS747	CY15C471J		MS-347	5%
C48	1000		250218-8				1RS01	ED-1000	MCB265	MS-31	10%
C49	047	400	250211-11	P468N-047	DF-503		CUB4S47		GEM-4147	4TM-S47	
C50	047	400	250211-5	P468N-047	DF-503		CUB4S47		GEM-4147	4TM-S47	
C51	1	600	250211-13	P468N-1	DF-104		CUB4P1		GEM-401	4TM-P1	
C52A	10000	1000 *	250218-3	DAC-37	DD6-103		BYA10M1			BL-S10	
B	10000	1000		DAC-37	DD6-103		BYA10M1			BL-S10	
C53	470		250218-6	BPD-00047	DD-471		BYA10T47	ED-470	UC-5347	5GA-T47	①

① Not used in some versions.

CONTROLS

ITEM No	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	MAGNAVOX PART No	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1A	1 meg	½	230135-1	B-70	A47-1meg-2	Q3-137	U93	Volume
B	Shaft			Not Req.	PS-3	Not Req.	Not Req.	
C	Switch			K31-1 ①	SWS-12	T8-1	U8-36	
R2A	500Ω	½	230136-50	B-415		QT-105	UT51R	Contrast
B	Shaft			Not Req.		Not Req.	Not Req.	
R3A	50K	½	230132-1	B-31	A47-50K-9	Q1-123	T48-L	Horiz. Hold
B	Shaft			Not Req.	KS8-3	Not Req.	Not Req.	
R4A	300K	½	230132-3	B-48	A47-300K-6	Q1-139	U48	Brightness
B	Shaft			Not Req.	KS8-3	Not Req.	Not Req.	

ITEM No	RATING		REPLACEMENT DATA							NOTES
	RESISTANCE	WATTS	MAGNAVOX PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.			
R5A	1.5meg	½	230132-13	B-743	A47-1.5meg -8	Q1-139	TA1551	Vert. Hold		
B	Shaft			Not Req.	KS8-3	Not Req.	Not Req.			
R6A	2.5meg	½	230146-2	AB-43	A47-2.5meg -8	B11-259	TA2851	Vert. Height		
B	Shaft			AK-1	TM3-K31	Not Req.				
R7A	3000Ω	½	230146-5	AB-8	A47-3000-8	B11-U3	PTA353L	Vert. Lin.		
B	Shaft			AK-1	FK31-1/4	TM3-K31	Not Req.			

* Use KH-1 with red label control.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		MAGNAVOX PART No.	NOTES
	OHMS	WATT		
R8	30000	5%	230094-190	
R9	10000		230094-48	
R10	47Ω		230104-46	
R11	82K	5%	230094-205	
R12	1000Ω		230104-62	
R13	1000Ω		230104-62	
R14	47Ω		230104-46	
R15	56K	5%	230094-198	
R16	10000		230104-63	
R17	120Ω		230104-51	
R18	470Ω			
R19	39000	5%	230094-173	
R20	1meg		230104-98	
R21	1meg		230104-98	
R22	470K		230104-94	
R23	43000	5	240073-1	
R24	82000	1	230105-73	
R25	82000	1	230105-73	
R26	270K		230104-84	
R27	1K	5%	230094-184	
R28	270K		230104-84	
R29	270K		230104-84	
R30	12K		230104-76	
R31	330Ω		230104-54	
R32	270K		230104-84	
R33	560K		230104-95	
R34	6800Ω		230104-72	
R35	680Ω		230104-60	
R36	1meg	5%	230094-198	
R37	1.2meg	5%	230094-233	
R38	1meg		230104-98	
R39	270Ω	2	230105-55	
R40	3300Ω		230104-68	
R41	4.7meg		230104-106	
R43	470K		230104-94	

ITEM No.	RATING		MAGNAVOX PART No.	NOTES
	OHMS	WATT		
R43	10K		230104-74	
R44	1meg		230104-98	
R45	33K		230104-78	
R46	1meg		230104-98	
R47	33000	5%	230094-171	
R48	100K		230104-86	
R49	100K		230104-86	
R50	3500Ω	5%	230094-171	
R51	1.5meg			Note 1
R52	22K		230104-78	
R53			230130-2	Note 3
R54	1meg	1	230105-98	
R55	1000Ω		230104-62	
R56	270Ω		230104-55	Note 3
R57	270Ω		230104-55	Note 3
R58	100K		230104-86	
R59	100K		230104-86	
R60	470K		230104-94	
R61	4.7meg		230104-106	
R62	6800Ω	5%	230094-179	
R63	13000	5%	230094-182	
R64	100K	5%	230094-207	
R65	120K	5%	230094-209	
R76	18K			
R67	470K		230104-94	
R68	15000	5	240071-35	
R69	15Ω		230104-40	
R70	33000	1	230105-68	
R71	27000		230104-67	
R73	1Ω	2	230106-41	
R73	1.9Ω	1	230107-3	
R74	680Ω	1	230104-60	
R75	5600Ω	7		
R76	180K		230110-1	
R77	330K			Note 4

Note 1. Some versions may use 1meg (Part #230094-238) in this application.
Note 2. Temperature compensating. Do not measure.
Note 3. Some versions may use 330Ω in this application.
Note 4. Not used in some versions.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					NOTES
	PRI.	SEC. 1	SEC. 2	SEC. 3	MAGNAVOX PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordorson PART No.	Triad PART No.
T1	117V	680VCT	5V	6.3V	300093-1		P-8079①		36R90 ①	R-86BC ①
	@1.6A	@ 240A	@ 3A	@6.8A						

① Use original mounting bracket.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	REPLACEMENT DATA							NOTES
		MAGNAVOX PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordorson PART No.	Triad PART No.	
T2	Vert. Osc.	230262-2B	B6703	A-3003	V406	VBO-201	26A04	A-97X	
	Alt. Vert. Osc.	230262-2							
T3	Vert. Output	230263-1	Z1807①	A-3834①	V315 ①	A-8141 ②	26R54 ②	A-109X ① ③	
T4A	Yoke-Horiz. (21MH)	XD850617-2	DF812 ④⑤	MDF-92 ④⑤	T90F19/43 ③	DY-18A ④⑤	Y-16 ④	Y-41 A ③	
B	(90°)-Vert. (45MH)	360617-1	DF812 ④⑤	MFD-82 ④⑤	T90F19/43 ③	DY-16A ④⑤	Y-16 ④ ③	Y-41 A NW33 ⑤	
	Alt. Yoke								
M7	Rear Cover & Centering Device	380738-1							
T5	Horiz. Output	360700-1			X55 *	A-8295 *		D-92 *	
T6	Width Coil (T-32MH)	360699-1		MWC-12 ②	20LR3A ②	WC-18	WC-10②	WLC-3 ②	

① Cut and tape blanking lead.
② Drill new mounting hole(s).
③ Connect as autoformer.
④ Use original yoke damping network.
⑤ Use original rear cover and centering device.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordorson Replacement Connections	Triad Replacement Connections
8			8	8		8
5 & 4			5	5		5
3-			3	3		3
2			2	2		2
1			1	1		1
Consist With Coil Arrows →			2 & 1	2 & 1		2 & 1

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI	SEC.	MAGNAVOX PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordorson PART No.	Triad PART No.	
T7	3200Ω	3-4Ω	230280-1	Z1006	A-3018	AU-604	A-3849	26B80	S-5Z	

SPEAKER

ITEM No.	TYPE				REPLACEMENT DATA		NOTES
	SIZE	FIELD	V C IMP.		MAGNAVOX PART No.	QUAM PART No.	
SP1	8"	PM	6-8Ω		583866 ①	8AA25 6 ①	① Phase
SP2	8"	PM	6-8Ω		583867 ①	8AJ26 1 ①	

COILS (RF-IF)

ITEM No	USE	REPLACEMENT DATA					NOTES
		MAGNAVOX PART No.	Meisner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	1st. Video IF	380654-1		17-4628			Includes 41.25MC Trap
L2	2nd. Video IF	380730-1		17-4623	TV-130	6219	VF-3
L3	3rd. Video IF	380644-1					Includes 47.25MC Trap
L4	4th. Video IF	380642-1		17-4611			Includes sasy.
L5	Shunt Peaking Coil	380623-12		17-3500	TV-303	6174	500 Microhenries
L6	Series Peaking Coil	380623-15		17-3250 *	TV-185 *	6181 *	VF-8 * 235 Microhenries, wound on 39K resistor
L7	Shunt Peaking Coil	380623-16		17-3300	TV-198	6230	VF-8 276 Microhenries
L8	1st. Sound IF	380704-1		20-1004	TV-151	1469 ▲	VF-3
L9	2nd. Sound IF	380715-1					
L10	Quadrature Coil	380716-1					SD-5
L11	RF Choke			19-1000	BC-561	4802	1.1 Microhenries -Note 1
L12	Fil. Choke			19-1000	BC-561	[redacted]	1 Microhenry, IRC part #CLA-Note 1

* Parallel with 39K resistor.
▲ Disregard tap.
Note 1. Not used in some versions.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES.		REPLACEMENT DATA					NOTES
	PRI.	SEC.	MAGNAVOX PART No.	Meisner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Thordorson PART No.	
L13	540		380579-1		TV-155 ▲		H-102	28-7 ▲ *	23-75 Millihenries ▲ Disregard tap. * Drill new mounting hole.

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					
	TOTAL DIRECT CURRENT	D.C. RESISTANCE	INDUCTANCE (0 CURRENT 1000 ⁽⁻⁾)	MAGNAVOX PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordorson PART No.	Triad PART No.
L14	.360A	37Ω	.5 Hy.	230085-3	C5017 ①	C-2996 ①	C-2326 ①	26C44 ①	C-27X ①

① Drill new mounting hole.

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA						NOTES
	CURRENT (Measured)	MAGNAVOX PART No	FEDERAL PART No.	GENERAL ELECTRIC PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.		
M3		530045-2 ①	1215 ①②		171 ① ②			① Selenium ② 3 Required.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA						NOTES
			MAGNAVOX PART No.		LITTELFUSE PART No.		BUSS PART No.		
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER	
M2	N	1/4A 125V 8/B	180690-3		333.250 (N 1/4A-125V 8/B	364000	N 1/4	KM 0 to 3/10	

CRYSTAL DIODES

ITEM No	ORIG TYPE	REPLACEMENT DATA			NOTES
	MAGNAVOX PART No.	CBS PART No.	SYLVANIA PART No.		
M3	1N84		1N84	1N60	Video Detector (Pigtail)

MISCELLANEOUS

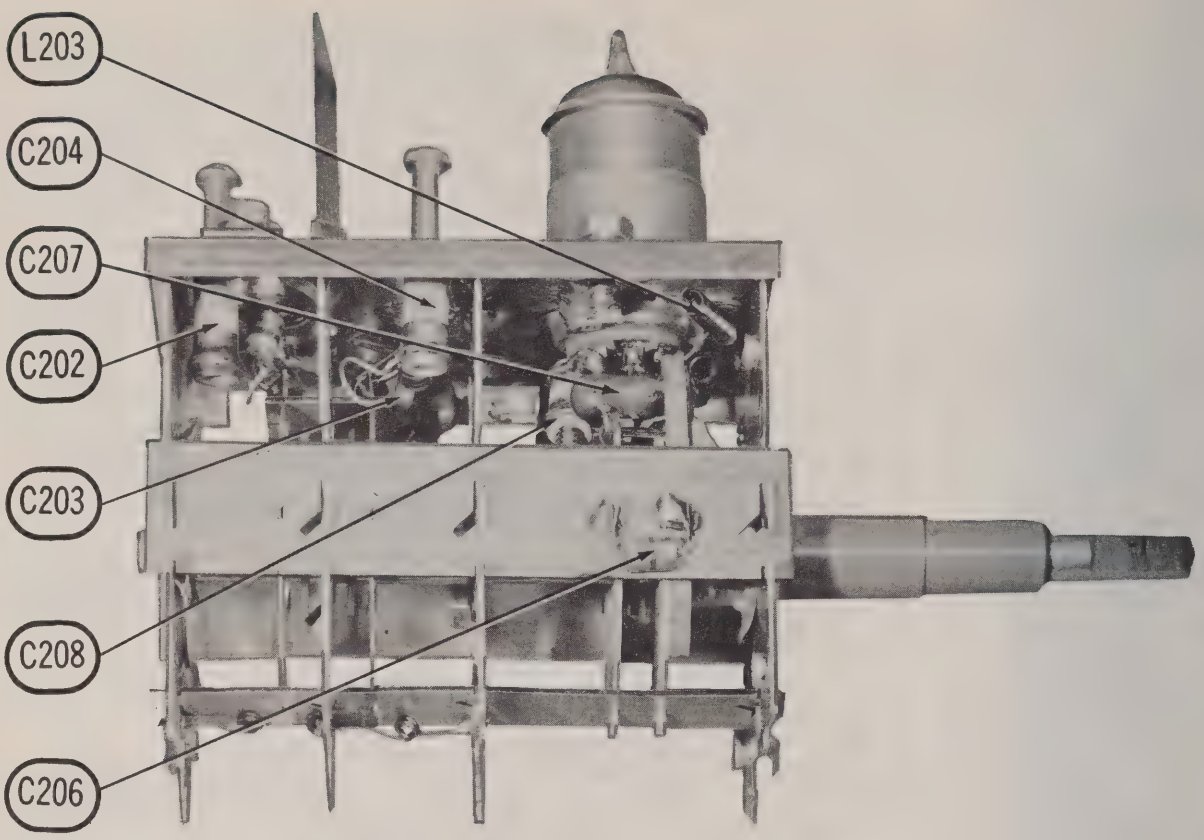
ITEM No.	PART NAME	MAGNAVOX PART No.	NOTES
M4	Tuner	700627-1	UHF-VHF (Ch. U24-01AA, -02AA, -03AA, -04AA, -06AA)
	Tuner	700624-1	VHF (Ch. V24-01AA, -02AA, -03AA, -04AA, -06AA)
M5	Tuner	700530-3	UHF (Ch. U24-01AA, -02AA, -03AA, -04AA, -06AA)
M6	Switch	160274-1	Local-Distant, Rotary -wafer type
M7	Centering Device	380738-1	Includes yoke cover
M8	Magnet	380692-8	Sniveta eliminator

WIRING DATA

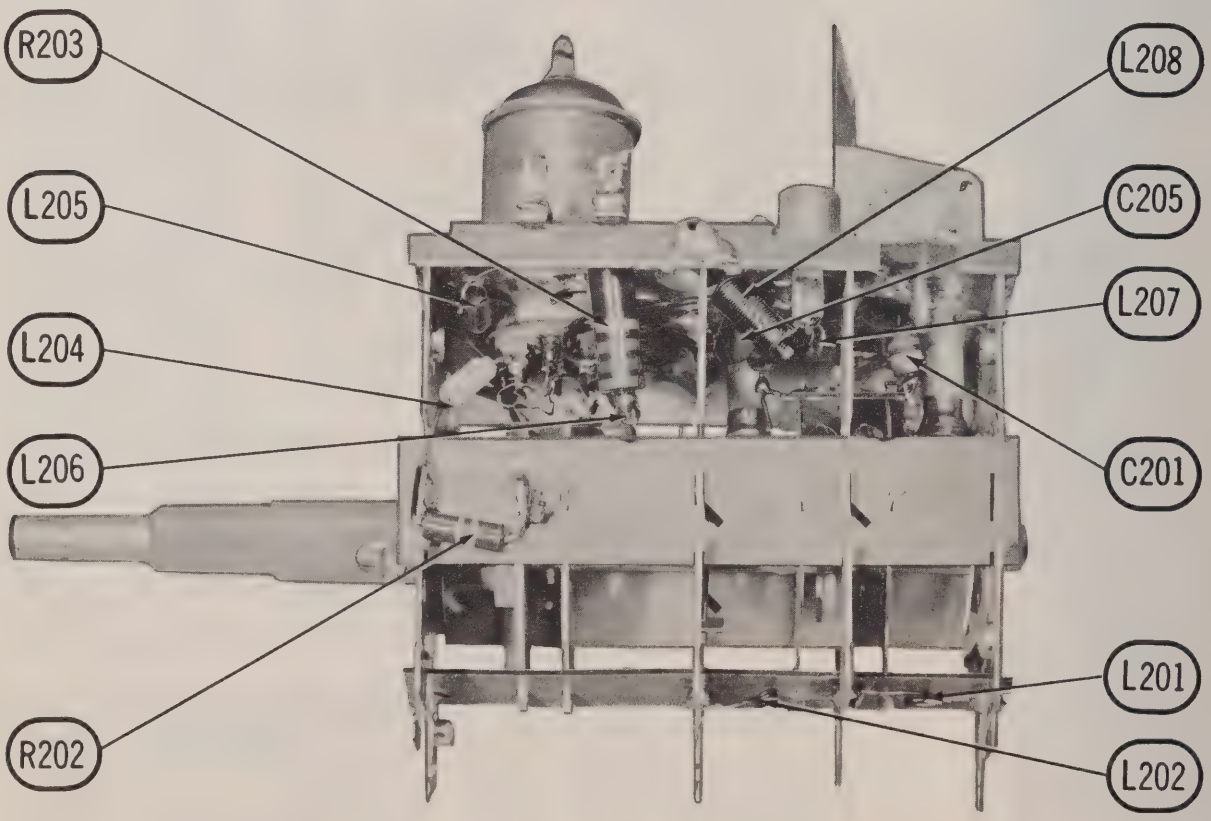
High Voltage Lead	Use BELDEN No. [redacted]
Shielded Hook-up Wire	Use BELDEN No. 8435 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8534 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No. 8874
300Ω Tuner Input Lead	Use BELDEN No. 8225
300Ω Antenna Lead-in	Use BELDEN No. 8230 or 8275
Antenna Rotor Cable	Use BELDEN No. 8464 (Flat) or 8464 (Round) - 4 Conductor 8455 (Round) - 5 Conductor 8458 (Round) - 8 Conductor

MAGNAVOX CH455S1 U24-01AA, U24-02AA, U24-03AA, U24-04AA, U24-06AA, V24-01AA, V24-02AA, V24-03AA, V24-04AA, (24 Series)

FOLDER 1



UHF TUNER-LEFT SIDE



UHF TUNER-RIGHT SIDE

TUNER ALIGNMENT INSTRUCTIONS (cont)

UHF IF ALIGNMENT

Connect bias as under "VHF Oscillator Alignment".
Set the Local-Distant switch to "Local" position and contrast control fully counter clockwise.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Set the fine tuning to the center of its range.
Use only enough sweep generator output to provide a usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
14.	1000Ω Carbon Resistor	High side to point ◇V. Low side to tuner chassis.	43.0MC (10MC Swp)	42.25MC 45.75MC	UHF	Vert. Amp. thru 10K across video detector load.	A228	Adjust for response curve similar to Fig. 205 with MINIMUM tilt.

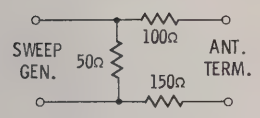


FIG 201

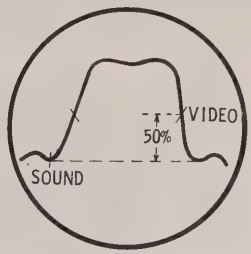


FIG. 202

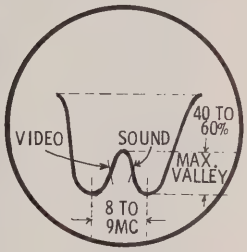


FIG. 203

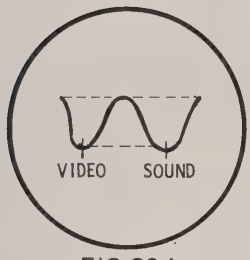


FIG. 204

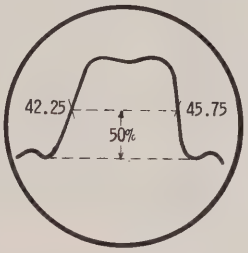
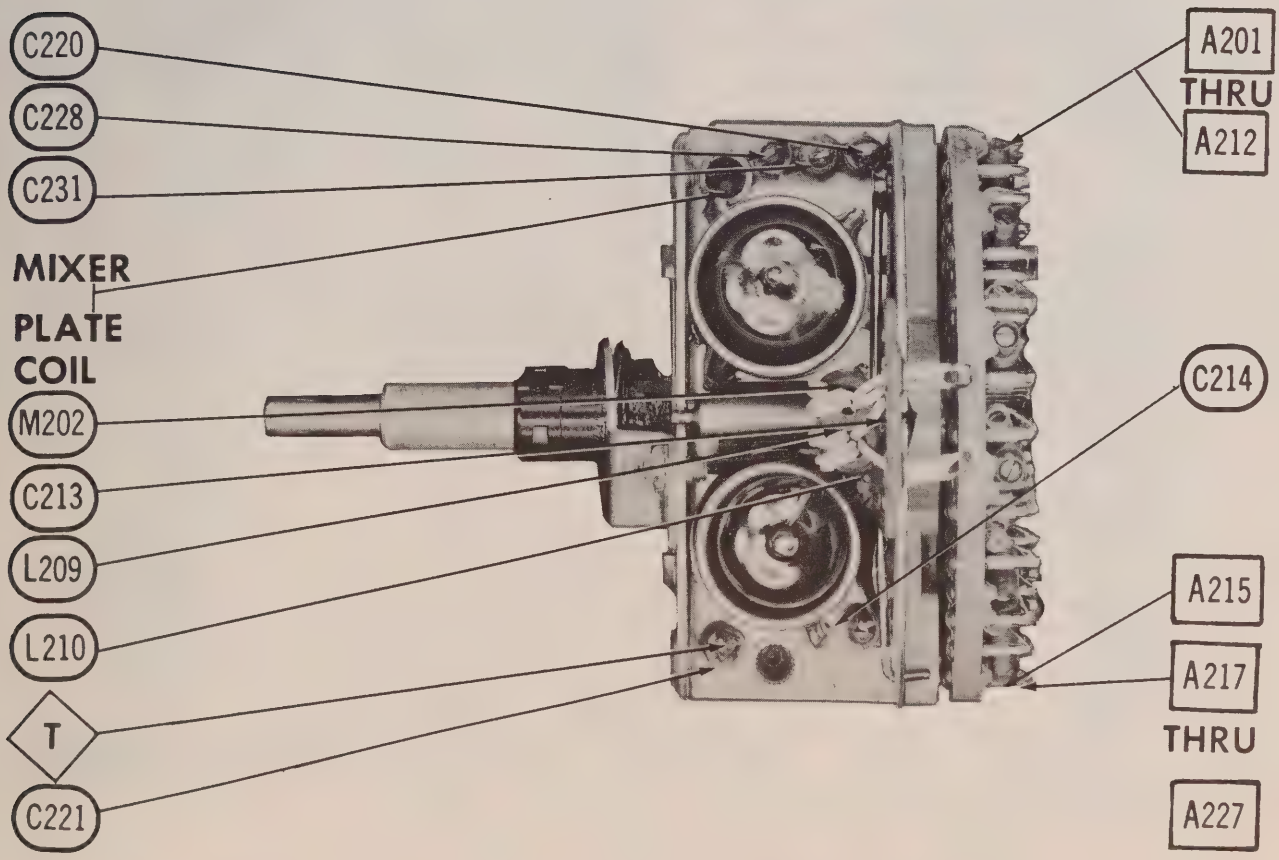


FIG. 205

PROPERTY OF
C. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO



RF TUNER—TOP VIEW

MAGNAVOX CHASSIS U24-01AA, U24-02AA, U24-03AA, U24-04AA, U24-06AA, V24-01AA, V24-02AA, V24-03AA, V24-04AA, V24-06AA (24 Series)

FOLDER 1

TUNER PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V201	RF Amplifier	6BN4	
V202	Mixer-Osc.	6CG8A	

ITEM No.	USE	TYPE	NOTES
V203	UHF Osc.	6AF4A	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	MAGNAVOX PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C201	1.2		250221-115	NPO-SI 1.0	TCZ-1		TCO-1		5TCCB-V1	
C202			250188-10							
C203	1.0		250221-114	NPO-SI 1.0	TCZ-1		TCO-1		5TCCB-V1	
C204			250188-10							
C205	47		250175-21		TCN-47		TC7-47			N750 5%
C206	.62		250221-1001							5%
C207	10		250088-140							N1500 5%
C208	2.3-4		250220-2							
C209	470		250175-8	BPD-00047	DD-471	L10T47	ED-470	UC-5347	5GA-T47	
C210	470		250175-8	BPD-00047	DD-471	L10T47	ED-470	UC-5347	5GA-T47	
C211	1000		250272-1	BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C212	800		250266-1							
C213	120		250262-1	BPD-00012	DD-121	L10T12	ED-120	UC-5312	5GA-T12	
C214	30		250263-1							
C215	15		250264-1	NPO-DI 15	DD-150	L10Q15	ED-15		5TCC-Q15	10%
C216	15		250265-1		TCZ-15		TCO-15			5%
C217	5		250274-1		TCZ-4R7		TCO-5			NPO 5%
C218	2-8		260145-1							
C219	47		250273-1							
C220	800		250266-1							
C221	800		250266-1							
C222	2-6		260144-1							
C223	1000		250272-1	BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C224	51		250267-1							N750
C225	2-6		260144-1							
C226	1.0		250268-1	NPO-SI 1.0	TCZ-1		TCO-1		5TCCB-V1	
C227	1000		250271-1	BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C228	30		250263-1							
C229	10		250270-1		TCN-10		TC7-10			N750 5%
C230	10		250269-1							N900
C231	800		250266-1							

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		MAGNAVOX PART No.	NOTES
	OHMS	WATT		
R201	100K		230104-86	
R202	22K		230104-78	
R203	820Ω	1	230145-61	
R204	4700Ω		230104-70	
R205	470Ω	1	230105-62	Note 1
R206	10K		230104-74	

ITEM No.	RATING		MAGNAVOX PART No.	NOTES
	OHMS	WATT		
R207	220K		230104-90	
R208	1000Ω		230104-62	
R209	10K		230104-74	
R210	10K		230104-74	
R211	5600Ω		230104-71	
R212	2200Ω		230104-66	

Note 1. VHF tuner #700624 uses 1000Ω 1W (Part #230105-62) in this application.

COILS (RF-IF)

ITEM No.	USE	MAGNAVOX PART No.	NOTES
L201	RF Choke	360574-30	
L202	RF Choke	360574-30	
L203	Cathode Choke	360522-7	
L204	Fil. Choke	360574-8	
L205	Fil. Choke	360574-8	
L206	RF Choke	360574-8	
L207	RF Choke	360574-12	

ITEM No.	USE	MAGNAVOX PART No.	NOTES
L208	RF Choke	360574-50	
L209	VHF Ant.Trans.	360744-1	
L210	IF Trap	360740-1	
L211	IF Trap	360741-1	
L212	Osc. Coil	360742-1	
L213	Mixer Plate Coil	360743-1	

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		MAGNAVOX PART No.	CBS PART No.	SYLVANIA PART No.	
M201		530036-1	1N82A	1N82A	UHF Mixer (Clip-in)

MISCELLANEOUS

ITEM No.	PART NAME	MAGNAVOX PART No.	NOTES
M202	Ant. Network	460921-1	Includes L209, L210, C213
M203	Rotor Assy.	160283-1	Complete, includes shaft
M204	Rear Cover Assy.	635750-1	Includes coils, caps and contacts UHF-VHF tuner part #700627
	Rear Cover Assy.	635749-1	VHF tuner part #700624
	Extension Contact	635751-1	UHF connections on rotor
	Osc. Slug	110375-1	12 used
	Spring Contact	635748-1	Stator (7 used)

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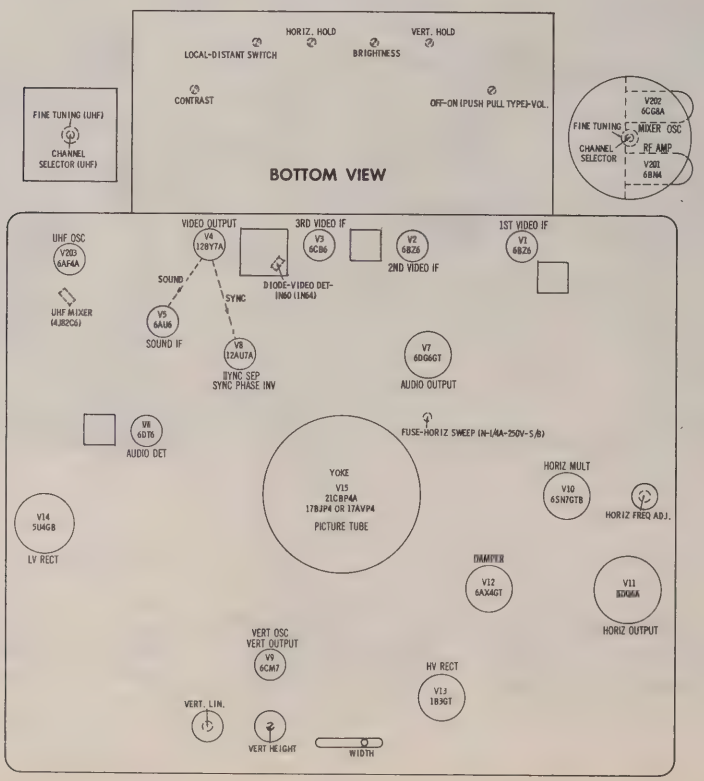
CHASSIS TOP VIEW

MAGNAVOX CHASSIS U24-01AA, U24-02AA, U24-03AA, U24-04AA, U24-06AA, V24-01AA, V24-02AA, V24-03AA, V24-04AA, V24-06AA (24 Series)

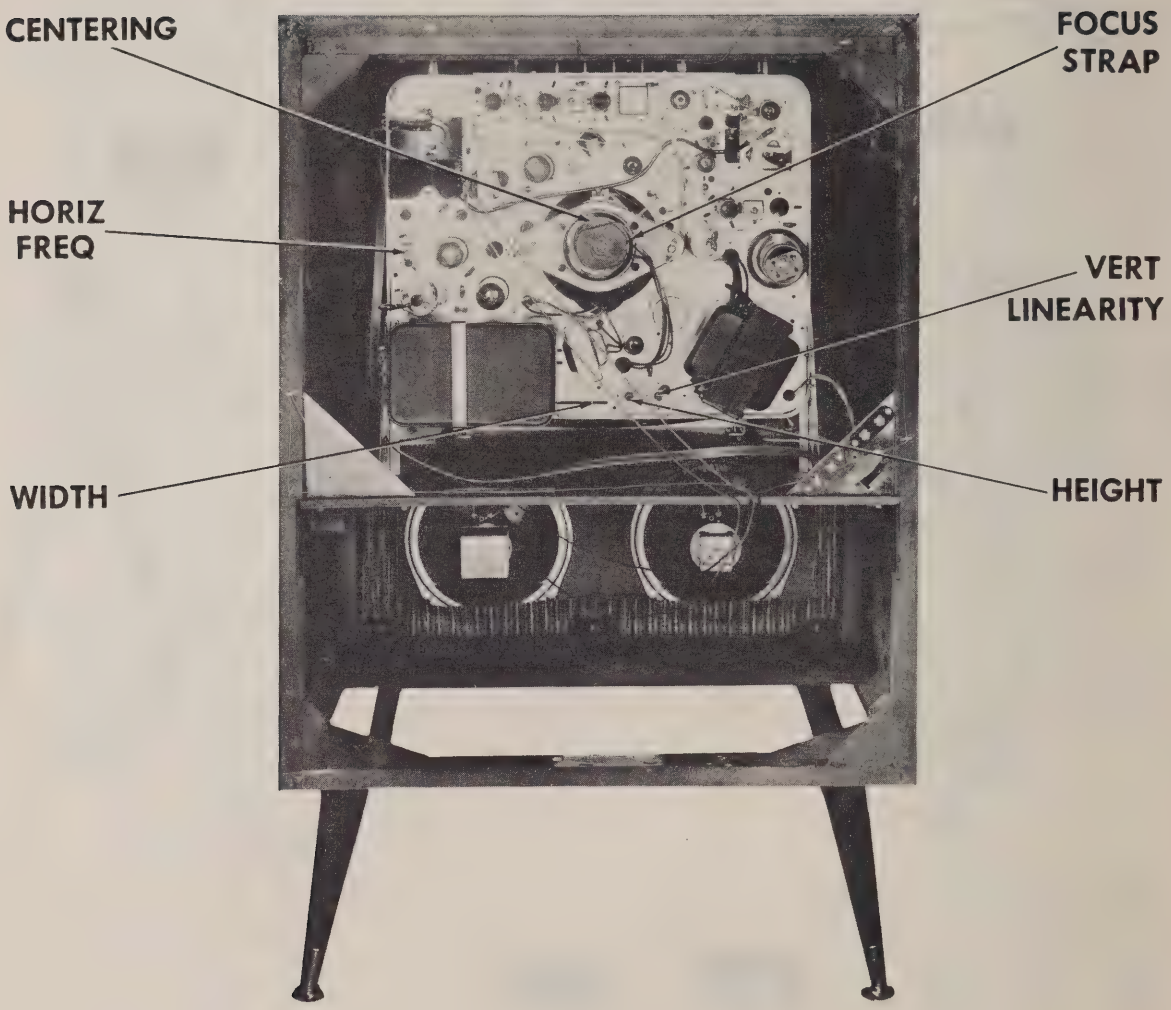
RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BZ6	1meg	47Ω	.1Ω	0Ω	▪ 1000Ω	▪ 1000Ω	0Ω		
V2	6BZ6	1meg	47Ω	.1Ω	0Ω	▪ 1000Ω	▪ 1000Ω	0Ω		
V3	6CB6	.1Ω	120Ω	.1Ω	0Ω	▪ 1000Ω	▪ 1000Ω	0Ω		
V4	12BY7A	• 80Ω	470K	0Ω	.1Ω	.1Ω	0Ω	† 4300Ω	▪ 8200Ω	0Ω
V5	6AU6	1.3Ω	0Ω	.1Ω	0Ω	▪ 12K	▪ 12K	220Ω		
V6	6DT6	3.4Ω	680Ω	.1Ω	0Ω	† 270K	▪ 6800Ω	560K		
V7	6DG6GT	TP	0Ω	▪ 490Ω	▪ 3600Ω	530K	TP	.1Ω	¶	
V8	12AU7A	† 1meg	4.7meg	0Ω	0Ω	0Ω	† 3300Ω	22K	3300Ω	.1Ω
V9	6CM7	‡ 4800Ω	NC	0Ω	0Ω	.1Ω	‡ 1.6meg	• 2.3meg	• 1.2meg	• 1400Ω
V10	6SN7GTB	470K	† 7500Ω	1300Ω	• 120K	† 120K	1300Ω	0Ω	.1Ω	
V11	6DQ6A	NC	.1Ω	NC	† 8500Ω	470K	TP	0Ω	15Ω	TOP CAP ‡ 26Ω
V12	6AX4GT	TP	NC	¶	NC	† 0Ω	NC	0Ω	.1Ω	
V13	1B3GT		PINS	1 THRU 8	HAVE	INFINITE	RESISTANCE			TOP CAP ‡ 376Ω
V14	5U4GB	NC	¶	NC	29Ω	NC	27Ω	NC	¶	
V15	21CBP4A	0Ω	11K	PIN 6 ‡ 3300Ω	PIN 10 ‡ 3300Ω	PIN 11 • 300K	PIN 12 .1Ω			
V201	6BN4	0Ω	1meg	0Ω	.1Ω	▪ 470Ω	0Ω	1meg		
V202	6CG8A	10K	▪ 5600Ω	0Ω	0Ω	.1Ω	▪ 1000Ω	▪ 10K	0Ω	230K
V203	6AF4A	▪ 820Ω	22K	.1Ω	.4Ω	1.2Ω	22K	▪ 820Ω		

¶ THIS READING CAN VARY GREATLY, (10K MINIMUM), DUE TO THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.
• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
▪ MEASURED FROM 135V SOURCE.
† MEASURED FROM 290V SOURCE.
‡ MEASURED FROM PIN 3 OF V15.
NC NO CONNECTION.
TP TIE POINT.



TUBE PLACEMENT CHART



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Set the horizontal hold control to the center of its range. Adjust the horizontal frequency slug (B1) until the picture falls into synchronization. Keep turning B1 in the same direction until the picture just falls out of sync. Remove the direction of rotation until the picture just holds sync. Rotate the horizontal hold control to both extremes of rotation. The picture should either stay in sync at both positions or should fall out of sync by an equal number of bars at each end of the control. If either of these conditions fail to occur, repeat procedure. Adjust the width slug (B2) for a picture SLIGHTLY wider than necessary to fill the picture mask horizontally.

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DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 6 push-on type knobs from the side. NOTE: On front tuning models - after removing 4 knobs, the plate covering the other 2 knobs may be pulled off to permit their removal.

2. Remove the rear cover and antenna terminal board.

3. Side tuning models: Remove 2 hex nuts from the brightness and vertical hold controls, loosen 1 metal screw in the tuner assembly and slide the assembly in to clear the shafts. Front tuning models: Remove 1 screw at the center of the controls, unhook the tuner by lifting up and sliding to the rear.

4. Remove the wing nut holding the top brace.

5. Remove speaker plug.

6. Remove 4 chassis bolts from the bottom.

7. Remove the chassis.

MODEL 21VT2 (CH. 88S3)

PACKARD-BELL MODELS 21SC6, 7, 8, 21SK3, 21ST3, 21VT2, 24SC2, 24VT1 (Ch. 88S3) and AM Tuner 3T3

TRADE NAME	Packard-Bell	MODELS	CHASSIS
		21SC6, 21SC7, 21SC8, 21SK3, 21ST3, 21VT2, 24SC2, 24VT1	88S3
		AM Tuner	3T3
MANUFACTURER	Packard-Bell Co. - Service Div., 11th. & Hope Streets, Los Angeles 15, California		
TYPE SET	Television Receiver		
TUBES	Seventeen		
POWER SUPPLY	110-120 Volts AC, 60 Cycle	RATING 180 Watts, 1.6 Amp. @ 117 Volts AC	
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of the VHF oscillator is possible by removing the channel selector and fine tuning knobs. Set the fine tuning at the center of its range. The adjustments are accessible, one at a time, as the channel selector is rotated. Adjust for best picture and sound.

PICTURE TUBE SAFETY GLASS CLEANING

Remove 3 wood screws holding the trim strip along the top edge of the safety glass. Tilt glass out and lift up to remove.

SPECIAL ADJUSTMENTS

A. Range
See Step 6 of Alignment Instructions.

B. Focus
The focus may be varied by means of a focus control. (For location, see tube placement chart).

C. Pix Lock
Normally the pix lock control will be set at counter clockwise stop. In fringe areas advance the control clockwise as far as possible without the picture tearing. Recheck all channels.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

The horizontal frequency coil is used as the horizontal hold control. Adjust the horizontal hold until the picture synchronizes horizontally. (For location, see tube placement chart).

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate sound IF detector buzz, adjust the ratio detector secondary (A9) located on bottom of chassis.

FUSES

A fuse is used for LV power supply protection and a fuse wire in the filament circuit.

CENTERING

Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

MODEL 21SK3 USES PACKARD-BELL RECORD CHANGER #58059. FOR SERVICE INFORMATION SEE SIMILAR UNIT COVERED IN PHOTOFACT SET 353 — FOLDER 16.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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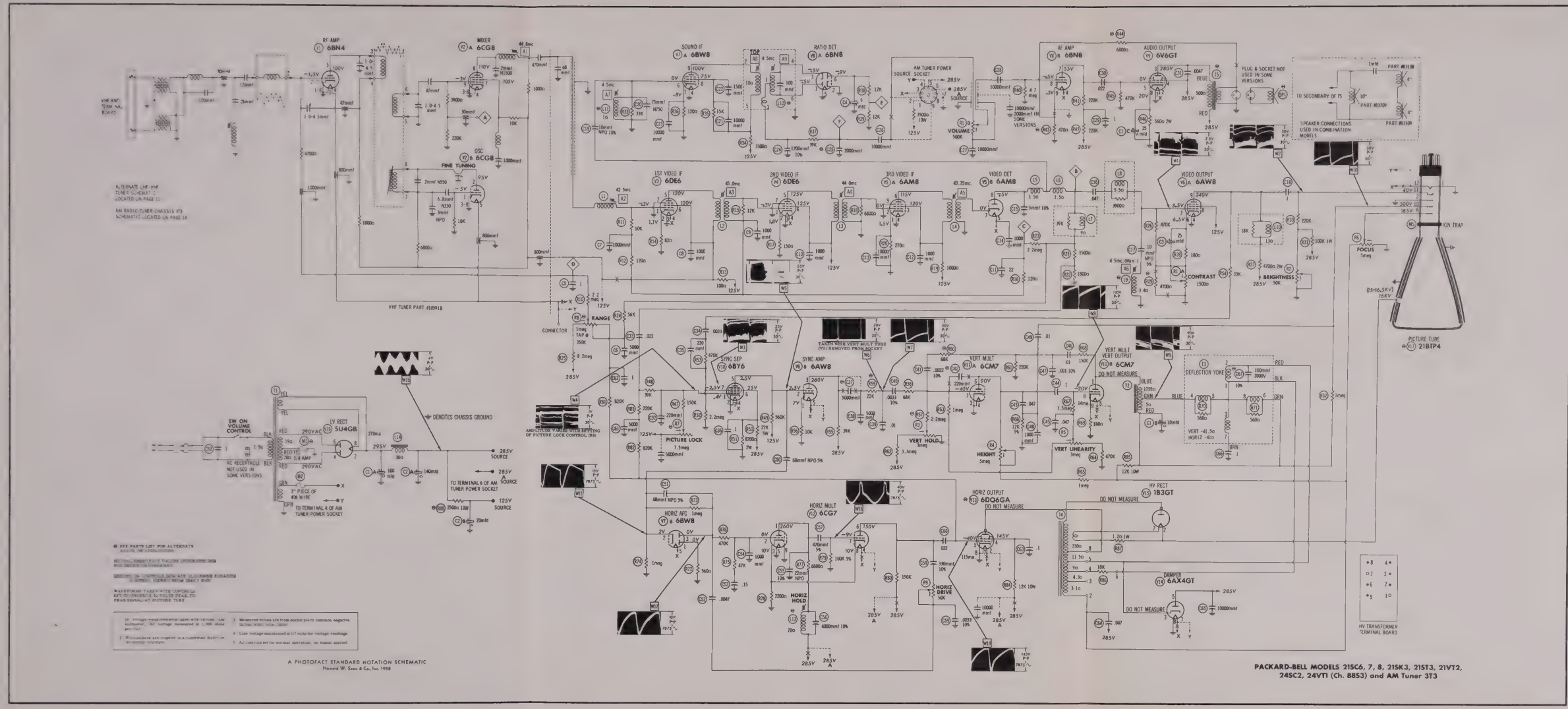
RF AMP V1 6BN4
MIXER V2A 6CG8
OSC V2B 6CG8
FINE TUNING
SOUND IF V7A 6BW8
RATIO DET V8A 6BN8
AM TUNER POWER SOURCE SOCKET
AF AMP V9B 6BN8
AUDIO OUTPUT V9 6V6GT
1ST VIDEO IF V3 6DE6
2ND VIDEO IF V4 6DE6
3RD VIDEO IF V5 6AM8
VIDEO DET V5B 6AM8
VIDEO OUTPUT V6A 6AW8
SYNC SEP V10 6BY6
SYNC AMP V5B 6AW8
VERT MULT V11A 6CM7
VERT MULT VERT OUTPUT V11B 6CM7
DO NOT MEASURE
HORIZ AFC V7B 6BW8
HORIZ MULT V12 6CG7
HORIZ OUTPUT V13 6DQ6GA
DO NOT MEASURE
HV RECT V15 1B3GT
DO NOT MEASURE
DAMPER V14 6AX4GT
DO NOT MEASURE
LV RECT V16 5U4GB
PICTURE TUBE V17 21BTP4
ION TRAP
VOLUME 500K
RANGE
PICTURE LOCK
VERT HOLD 3meg
HEIGHT 5meg
VERT LINEARITY 3meg
HORIZ HOLD 70a
HORIZ DRIVE 50K
CONTRAST 1500a
BRIGHTNESS 50K
FOCUS 5meg
DEFLECTION YOKE
SW ON VOLUME CONTROL
AC RECEPTACLE BLK NOT USED IN SOME VERSIONS
3/4 AMP
290VAC
1" PIECE OF #26 WIRE
TO TERMINAL 4 OF AM TUNER POWER SOCKET
TO TERMINAL 6 OF AM TUNER POWER SOCKET
285V SOURCE
125V SOURCE
DENOTES CHASSIS GROUND
VHF TUNER PART #10941B
ALTERNATE UHF-VHF TUNER SCHEMATIC LOCATED ON PAGE 11
AM RADIO TUNER CHASSIS 3T3 SCHEMATIC LOCATED ON PAGE 14
PLUG & SOCKET NOT USED IN SOME VERSIONS
SPEAKER CONNECTIONS USED IN COMBINATION MODELS
TO SECONDARY OF T5
PART #83708
PART #83709
HV TRANSFORMER TERMINAL BOARD
CONNECTOR
AMPLITUDE VARIES WITH SETTING OF PICTURE LOCK CONTROL (R6)
TAKEN WITH VERT MULT TUBE (V11) REMOVED FROM SOCKET
SEE PARTS LIST FOR ALTERNATE
WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 5 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE
1 DC voltage measurements made with vacuum tube voltmeter, AC voltage measured on 1,000 ohms per volt.
2 Parenthesis are control settings for maximum signal.
3 Measured values are from socket pin to common negative (chassis) point.
4 Line voltage maintained at 117 volts for voltage readings.
5 All controls set for normal operation, no signal applied.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

PACKARD-BELL MODELS 21SC6, 7, 8, 21SK3, 21ST3, 21VT2, 24SC2, 24VT1 (Ch. 8853) and AM Tuner 3T3

TUBE PLACEMENT CHART

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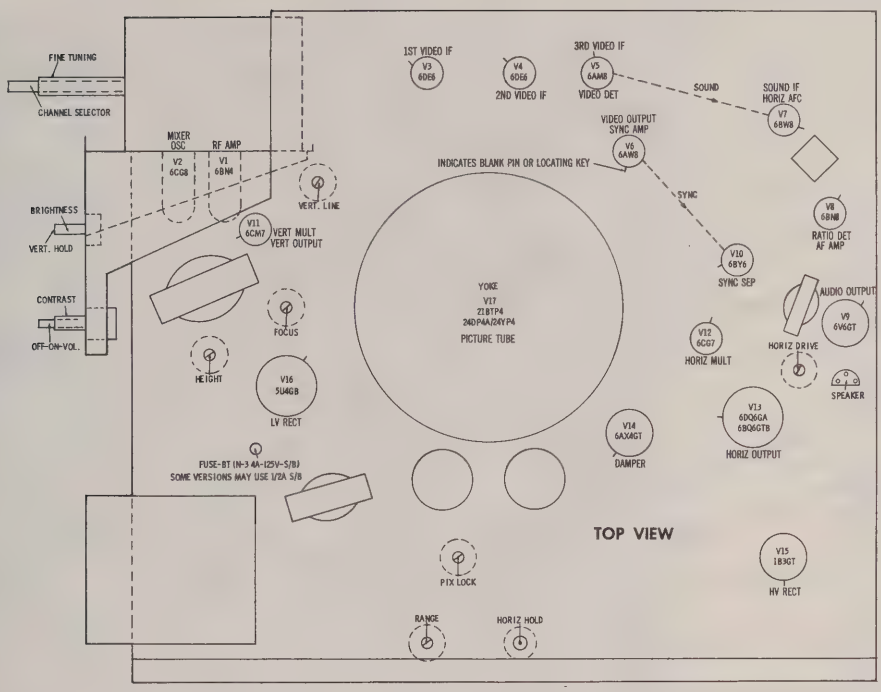


TUBE FAILURE CHECK CHART

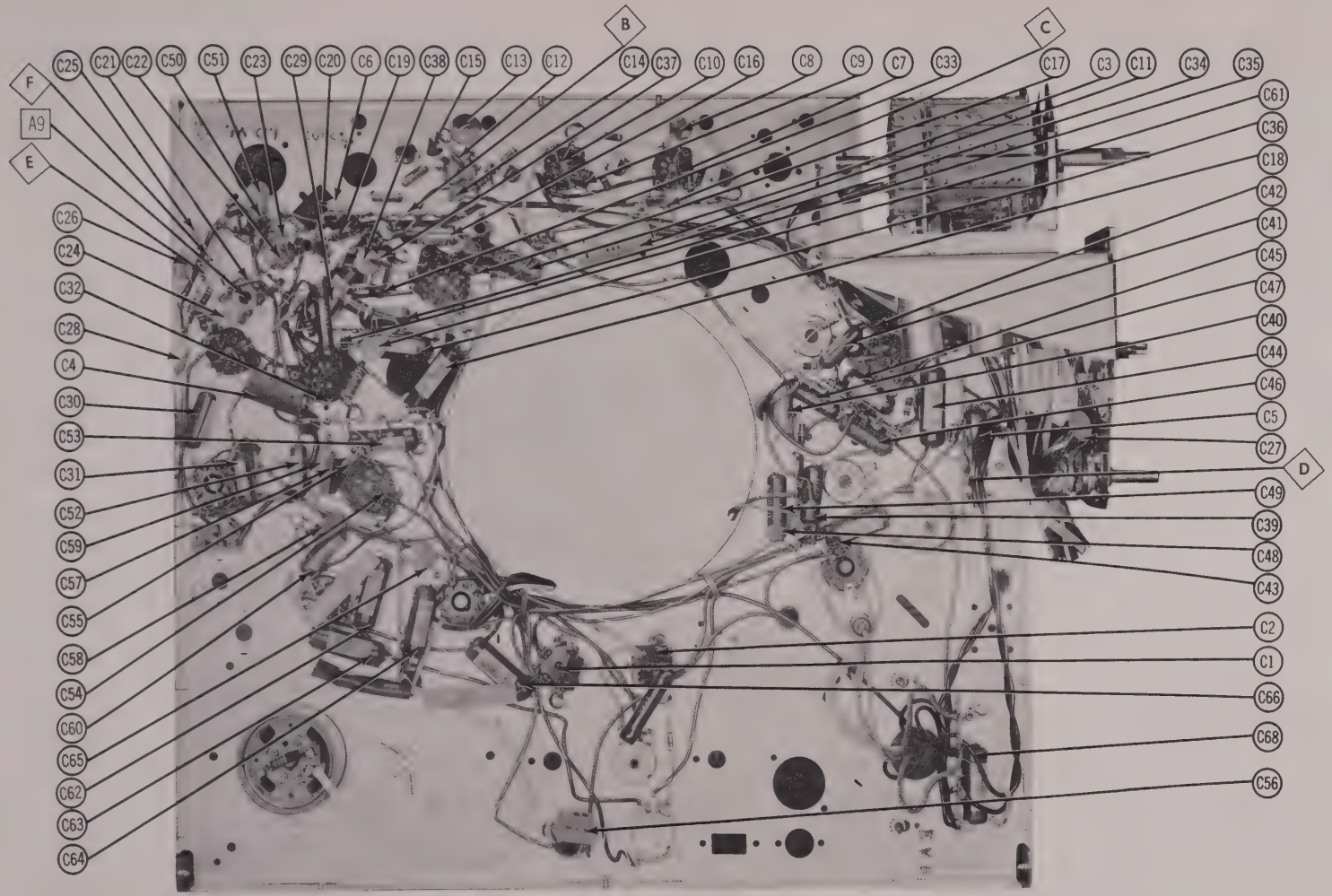
The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

POWER SUPPLY FAILURE
No raster, no sound - **Fuse (M1, M2), V16**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V3, V4, V5**
No pic, no sound, has snow - **V1, V2, V3**
No pic, has sound, has raster - **V6, V17**
Has pic, no sound - **V7, V8, V9**

SYNC FAILURE
No vert. sync - **V10, V6**
No horiz. sync - **V10, V6, V7**
No vert. or horiz. sync - **V10, V6**

SWEEP FAILURE
No raster, has sound - **V7, V12, V13, V14, V15, V17**
No vertical deflection - **V11**
Poor vert. linearity or foldover - **V11**
Poor horiz. linearity or foldover - **V12, V13, V14**
Narrow picture - **V12, V13, V14, V15**
Vert. off freq. - **V11**
Horiz. off freq. - **V12**



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

The high voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.

VIDEO IF ALIGNMENT

Set the generator output to maximum.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	.001mfd	High side to point (A). Low side to chassis. (Sets with UHF-VHF Tuner - High side to ungrounded tube shield floating over 6AT8. Low side to chassis.)	44.8MC	Any non-interfering channel	DC probe to point (B). Common to chassis.	A1	Adjust for maximum deflection.
2.	"	"	42.5MC	"	"	A2	"
3.	"	"	45.0MC	"	"	A3	"
4.	"	"	44.0MC	"	"	A4	"
5.	"	"	43.25MC	"	"	A5	Adjust for maximum deflection. Repeat steps 1 thru 5.

OVERALL VIDEO IF RESPONSE CHECK

Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use a separate marker generator and connect the high side to the ground connection of the tuner output cable. Low side to mixer-osc. tube shield.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
6.	Two 120Ω Carbon Resistors	Across antenna terminals with 120Ω in each lead.	63MC (10MC Swp)	Not used	3	USE VTVM. DC probe to point (C). Common to chassis.	Range Control (R8)	Adjust sweep generator output to produce -4 volts AGC at point (C). Adjust range control (R8) so that voltage at points (C) and (D) are the same. Then if necessary, re-adjust sweep output so that AGC voltage is again -4 volts.
7.	"	"	"	41.25MC 43.3MC 45.0MC 45.75MC	"	Vert. Amp. thru 22K to point (B). Low side to chassis.		Check for response similar to Fig. 1 with markers as indicated. Retouch A2 for over-all bandwidth. A1 to place 45.75MC marker at 50% on curve, A3 for correct position of 45.0MC marker, A4 to place 41.25MC marker and to correct bottom portion of response curve and A5 to control shape of curve on low side. Note position of 45.0MC marker on response curve. It must not exceed 97% on channel 3 or a smeared picture may result on higher channels.

4.5MC TRAP ALIGNMENT

Turn the contrast control fully clockwise.
If a 4.5MC signal generator of crystal accuracy capable of at least one volt output is not available, tune in a TV station and adjust A6 for MINIMUM 4.5MC beat interference in the picture.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
8.	.01mfd	High side to point (B). Low side to chassis.	4.5MC	Any non-interfering channel	RF probe to pin 11 (cathode) of picture tube. Common to chassis.	A6	Adjust for MINIMUM deflection with 1 volt signal input or more.

SOUND IF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
9.	.01mfd	High side to point (B). Low side to chassis.	4.5MC (Unmod)	Any non-interfering channel	DC probe to pin 6 (plate) of 6BN8 (V8). Common to chassis.	A7, A8	Adjust for maximum deflection.
10.	"	"	"	"	DC probe to point (E). Common to point (F).	A9	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.

OSCILLATOR ALIGNMENT

Set the fine tuning at the center of its range. The adjustments are accessible, one at a time, as the channel selector is rotated. Adjust for best picture and sound.

RF AND MIXER ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

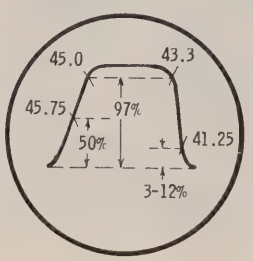


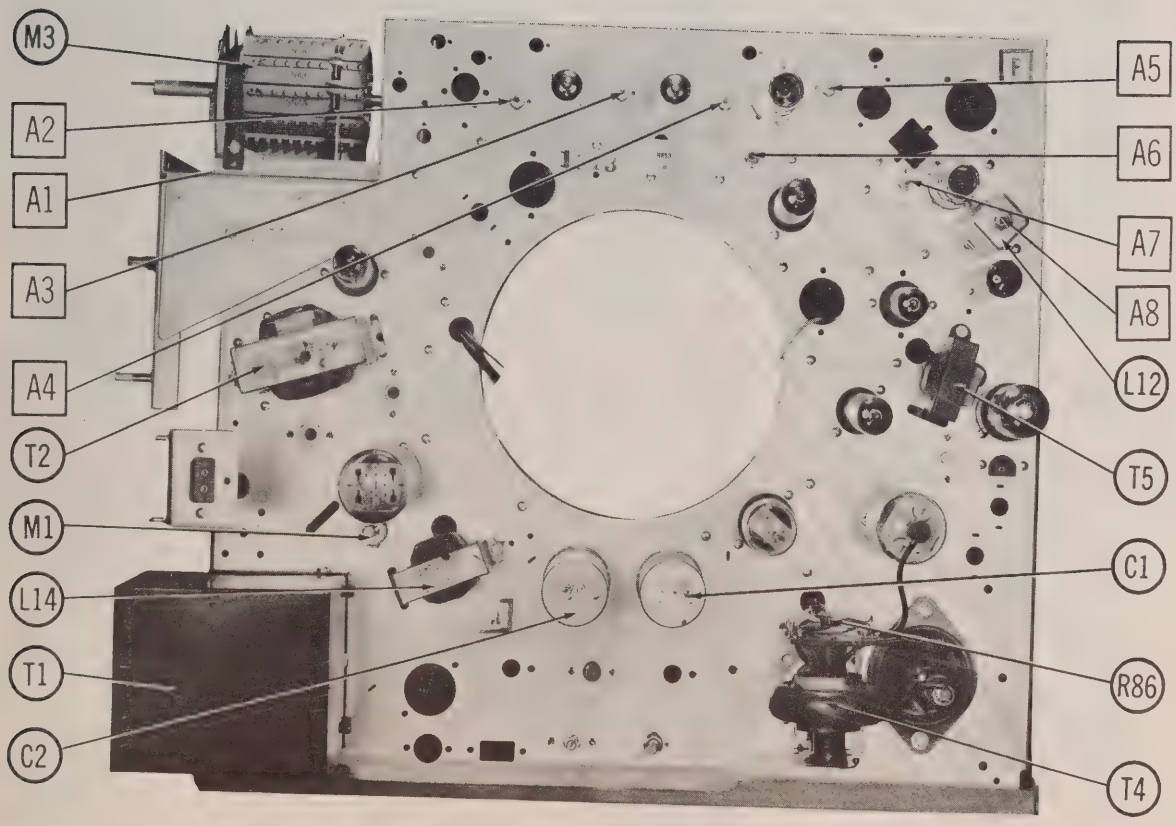
FIG. 1

ALIGNMENT INSTRUCTIONS (cont)

RADIO ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
11.	.001mfd	High side to pin 7 of 6BE6 (converter). Low side to chassis.	455KC	Radio	540KC	Across voice coil	A10, A11, A12, A13	Adjust for maximum deflection.
12.		Loop	1620KC	"	1620KC	"	A14	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
13.		"	1500KC	"	Tune to 1500KC signal	"	A15	Adjust for maximum deflection.



CHASSIS TOP VIEW

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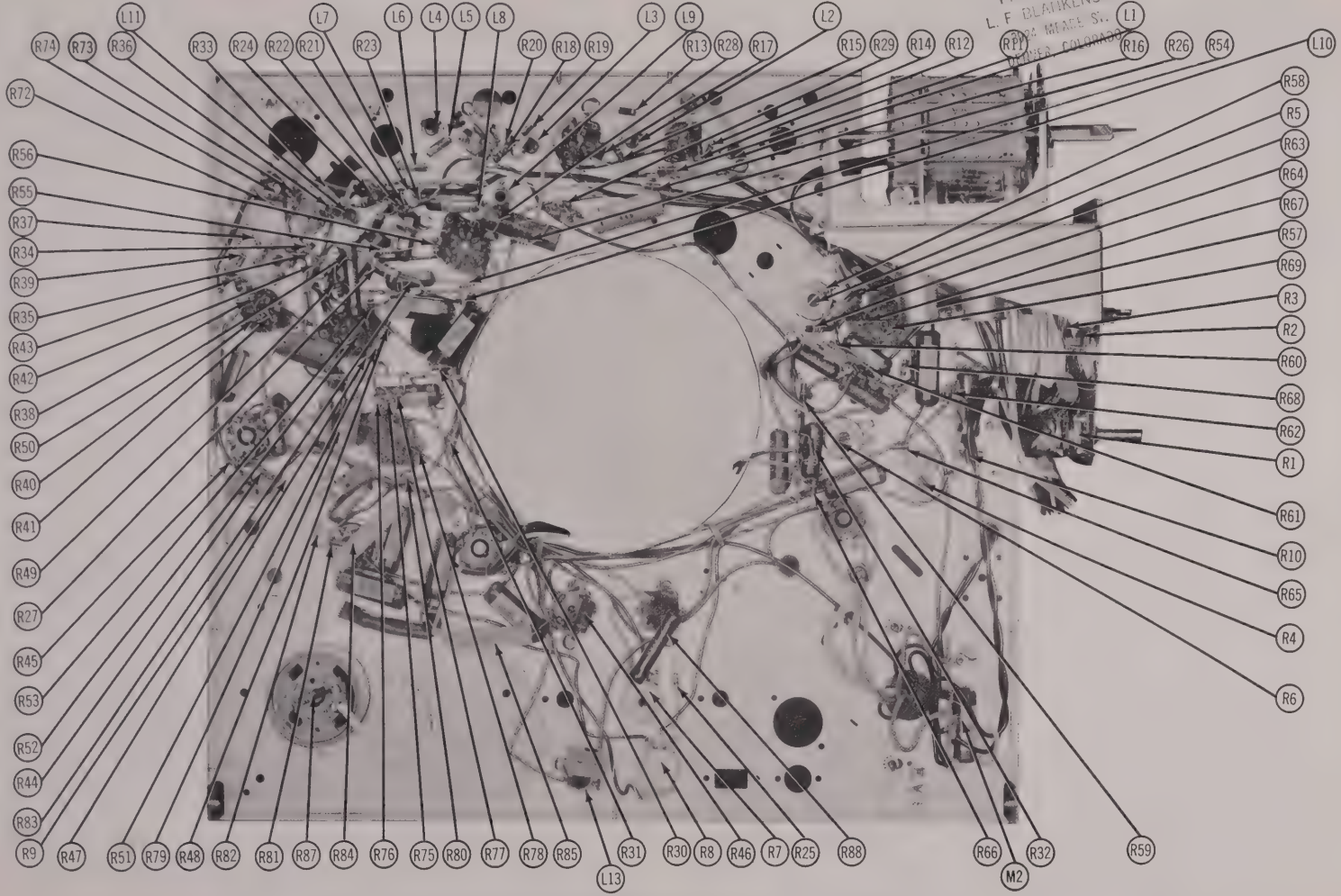


CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENTIFICATION

RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6BN4	0Ω	•2.7meg	0Ω	.1Ω	†3600Ω	0Ω	• 2.7meg		
V2	6CG8	10K	†9400Ω	0Ω	0Ω	.1Ω	†3600Ω	†12K	0Ω	220K
V3	6DE6	2.2meg	82Ω	0Ω	.1Ω	†2600Ω	†2600Ω	0Ω		
V4	6DE6	2.2meg	150Ω	0Ω	.1Ω	†2500Ω	†2500Ω	0Ω		
V5	6AM8	270Ω	.1Ω	†3500Ω	0Ω	.1Ω	†3500Ω	.1Ω	3300Ω	0Ω
V6	6AW8	10K	†560K	†40K	0Ω	.1Ω	• 400Ω	470K	†2500Ω	†4700Ω
V7	6BW8	560Ω	1meg	2meg	0Ω	.1Ω	1Ω	120Ω	†20K	†5800Ω
V8	6BN8	INF	0Ω	INF	.1Ω	0Ω	24K	†440K	4.7meg	470Ω
V9	6V6GT	NC	.1Ω	†500Ω	†0Ω	470K	TP	0Ω	560Ω	
V10	6BY6	200K	0Ω	0Ω	.1Ω	†560K	†16K	2.2meg		
V11	6CM7	‡12K	NC	0Ω	0Ω	.1Ω	• †3.5meg	• 1.5meg	• 2.5meg	180Ω
V12	6CG7	†6900Ω	2.5meg	2200Ω	.1Ω	0Ω	†150K	100K	2200Ω	0Ω
V13	6DQ6GA	TP	.1Ω	NC	†12K	600K	TP	0Ω	0Ω	TOP CAP ‡11.5Ω
V14	6AX4GT	TP	NC	¶	TP	†0Ω	NC	.1Ω	0Ω	
V15	1B3GT	PINS 1 THRU 8 HAVE INFINITE RESISTANCE								TOP CAP ‡340Ω
V16	5U4GB	NC	¶	NC	20Ω	NC	19Ω	NC	¶	
V17	21BTP4	0Ω	0Ω	PIN 6 •‡1.2meg	PIN 10 ‡1meg	PIN 11 • 190K	PIN 12 .1Ω			

¶ THIS READING CAN VARY GREATLY, (10K MINIMUM), DUE TO THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.

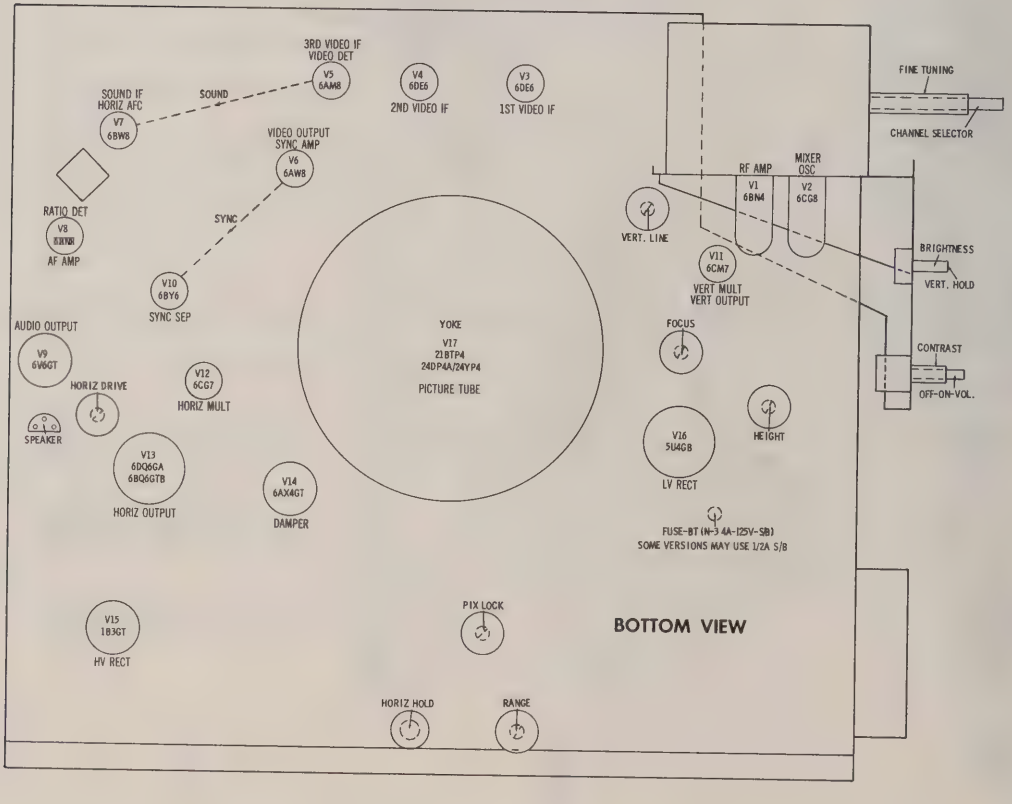
• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.

† MEASURED FROM 285V SOURCE.

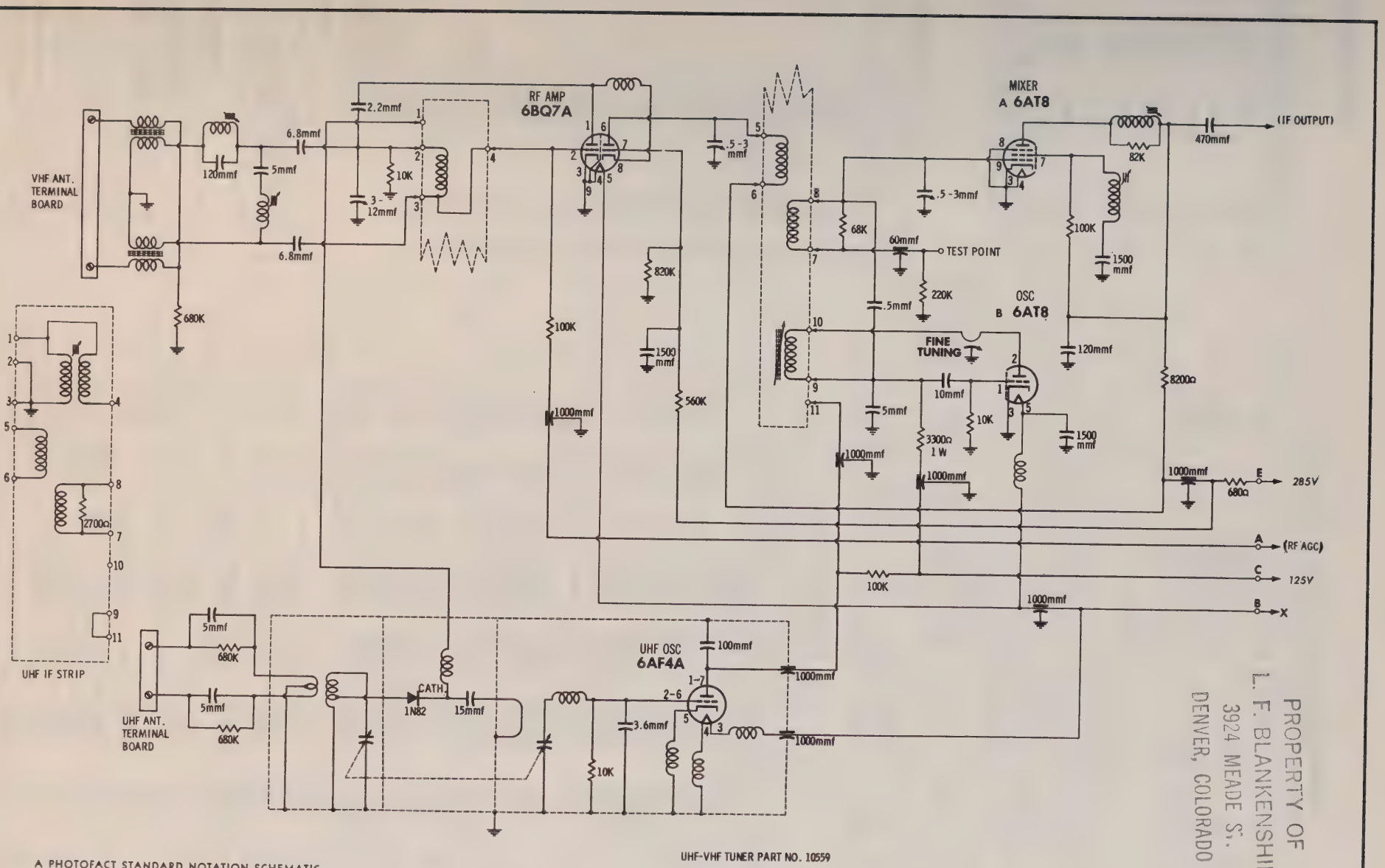
‡ MEASURED FROM PIN 3 OF V14.

NC NO CONNECTION .

TP TIE POINT.



TUBE PLACEMENT CHART



A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

UHF-VHF TUNER PART NO. 10559

ALTERNATE UHF-VHF TUNER SCHEMATIC

PACKARD-BELL MODELS 21SC6, 7, 8, 21SK3, 21ST3, 21VT2, 24SC2, 24VT1 (Ch. 8S3) and AM Tuner 3T3

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	RF Amp	6BN4	
V2	Mixer-Osc	6CU8	
V3	1st Video IF Amp	6DE8	
V4	2nd Video IF Amp	6DE8	
V5	3rd Video IF Amp - Video Det	6AM8	
V6	Video Output-Sync Amp	6AW8	
V7	Sound IF Amp -Horiz AFC	6BW8	
V8	Ratio Det - AF Amp	6BN8	

ITEM No	USE	TYPE	NOTES
V9	Audio Output	6V6GT	
V10	Sync Sep	6BY6	
V11	Vert Mult--Vert Output	6CM7	
V12	Horiz Mult	6CX8	
V13	Horiz Output	6DQ6GA	6BQ6GTB*
V14	Damper	6AX4GT	
V15	HV Rectifier	1B3GT	
V16	LV Rectifier	5U4GB	

* Alternate

PICTURE TUBE

ITEM No	REPLACEMENT DATA				NOTES
	Packard-Bell PART No	GENERAL ELECTRIC PART No	RCA PART No	SYLVANIA PART No	
V17	21BT4	21BT4 1	21ATP4-A, 21ATP4 2	21BTP4 2	1 Aluminized 2 Silvermas 3 Silver screen "85"
	24DP4A, 24YP4	24DP4A, 24YP4 1	24DP4A, 24YP4 2		

ELECTROLYTIC CAPACITORS

ITEM No	RATING		REPLACEMENT DATA					
	CAP	VOLT	Packard-Bell PART No	AEROVOX PART No.	CORNELL DUBILIER PART No	MALLORY PART No	PYRAMID PART No	SANGAMO PART No.	SPRAGUE PART No.
C1A	40-80	350	AF113-155-A0	D0750		FP356	TMT-197	T-537	TVL-3806.4
B	20-40	475				TC26		MT-4720	
C	4.25	25							
C2A	40-80	350	34113			FP331 6	TMT-164	D-417	R3483 *
B	4.20	350						MT-4520	
C3	25	25	34006A	PR325V25	BBR25-25	TC26	TD-25-25	MT-0325	TVA-1305
C4	3	50	34028	PR50V3	BBR3-50	TC30	TD-3-50	MT-0504	TVA-1303

* Non-catalog item

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	Packard-Bell PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C5	.1	200	32107	P288N-1		DF-104	CUB32P1		GEM-201	2TM-P1	
C6	5000		32080	BPD-008		DD-502	BYA502E	ED-005	DC525	5HK-D5	
C7	1000		32080	BPD-001		DD-102	BYA5D1	ED-1000	DC521	5HK-D1	
C8	1000		32080	BPD-001		DD-102	BYA5D1	ED-1000	DC521	5HK-D1	
C9	5000		32080	BPD-005		DD-502	BYA502E	ED-005	DC525	5HK-D5	
C10	1000		32080	BPD-001		DD-102	BYA5D1	ED-1000	DC521	5HK-D1	
C11	.25	200	32090	P288N-23			CUB32P23		GEM-3022	2TM-P22	
C12	1000		32080	BPD-001		DD-102	BYA5D1	ED-1000	DC521	5HK-D1	
C13	10000		32080	BPD-01		DD-102	BYA5B1	ED-01	DC5D1	5HK-S1	
C14	10000		32080	BPD-001		DD-102	BYA5D1	ED-1000	DC521	5HK-D1	
C15	15		32100	BPD-SI 5		DD-050	L10Y5	ED-5	ZT-355	5TCCB-Y5	10%
C16	.047	200	32108	P288N-047		DF-503	CUB3547		GEM-4147	2TM-S47	
C17	20		32117			TC26-10		TCO-10			NPO 5%
C18	.1	200	32143	P288N-1		DF-104	CUB2P1		GEM-601	5TM-P1	
C19	33		32127			TC26-10		TCO-10			NPO 5%
C20	75			NT50-DZ 75		TCH-75	TCT-75	NT-5475		5TCU-Q75	N750
C21	20000		32089	BPD-01		DD-103	BYA5B1	ED-01	DC5D1	5HK-S1	
C22	5000		32080	BPD-005		DD-153	BYA502E5	ED-1500	DC5215	5HK-D15	
C23	20000		32089	BPD-01		DD-103	BYA5B1	ED-01	DC5D1	5HK-S1	
C24	.300		32149				UR5D1	ED-1200		M5-D12	10%
C25	1000			BPD-002		DD-203	BYA502E	ED-002	DC522	5HK-D3	②
C26	10000		32089	BPD-01		DD-103	BYA5B1	ED-01	DC5D1	5HK-S1	
C27	20000		32089	BPD-01		DD-103	BYA5B1	ED-01	DC5D1	5HK-S1	
C28	20000		32089	BPD-01		DD-103	BYA5B1	ED-01	DC5D1	5HK-S1	
C29	.1	200	32143	P288N-1		DF-104	CUB2P1		GEM-601	5TM-P1	
C30	.033	400	32133	P288N-033		DF-333	CUB4S33	ED-03	GEM-4133	4TM-S33	
C31	.0047	600	32137	P288N-0047		DF-472	CUB4D47	GP-4700	GEM-4347	6TM-D47	
C32	.220	200	32081	BPD-00022		DD-223	L10T22	ED-220	UC-5222	5GA-T22	
C33	.033	400	32103	P288N-033		DD-333	CUB4S33	ED-03	GEM-4133	4TM-S33	
C34	.0033	600	32117	P288N-0033		DF-332	CUB4D33	GP-3300	GEM-4333	6TM-D33	
C35	220		32081	BPD-00022		DD-223	L10T22	ED-220	DC-5222	5GA-T22	
C36	1.0	200	32107	P288N-1		DF-104	CUB2P1		GEM-201	2TM-P1	
C37	5000		32080	BPD-005		DD-502	BYA502E	ED-005	DC525	5HK-D5	②
C38	5000		32083	BPD-005		DD-502	BYA502E	ED-005	DC525	5HK-D5	
C39	.01	600	32131	P288N-01		DS-103	CUB5S1	GP-10000	GEM-511	5TM-S1	
C40	.0033	600	32130						GEM-15233		10%
C41	.0022	600	32318						GEM-15225		10%
C42	220		32081	BPD-00022		DD-221	L10T22	ED-220	DC-5222	5GA-T22	②
C43	.047	200	32108	P288N-047		DF-503	CUB3547		GEM-4147	2TM-S47	
C44	.1	200	32143	P288N-1		DF-104	CUB2P1		GEM-601	5TM-P1	
C45	.047	200	32108	P288N-047		DF-503	CUB3547		GEM-4147	2TM-S47	
C46	51	500	32139	P288N-51		DS-103	CUB5S1	GP-10000	GEM-511	5TM-S1	
C47	.001	600	32333								10%
C48	5000		32080	BPD-001		DD-102	BYA5D1	ED-1000	DC521	5HK-D1	
C49	51	500	32139	P288N-51		DS-103	CUB5S1	GP-10000	GEM-511	5TM-S1	
C50	68		32302			TC26-68		TCO-68			NPO 5%
C51	68		32302			TC26-68		TCO-68			NPO 5%
C52	.047	600	32137	P288N-0047		DS-473	CUB5D47	GP-4700	GEM-5347	5TM-D47	
C53	.10	200	32106	P288N-10			CUB2P10		GEM-2015	2TM-P15	
C54	5000		32080	BPD-001		DD-102	BYA5D1	ED-1000	DC521	5HK-D1	
C55	22		32308	BPD-01 E2		TC26-22	C10Q22C	TCO-22		STCC-Q22	NPO 10%
C56	680		32306				DB5D6		MCH583	M5-24	10%
C57	470		32326	2464-00047			5HS747	CT15C47U		M5-347	5%
C58	33		32320	2490-00053		DS-331	5HS733	ED-330		M5-331	10%
C59	.022	600	32324						GEM-4322		10%
C60	.022	600	32141	P288N-022		DD-223	CUB6S22	ED-02	GEM-6122	6TM-S22	
C61	680		32321	P288N-681		DD-681	BYA1D68	ED-680	DC5D5	5HK-D5	
C62	1	200	32107	P288N-1		DF-104	CUB2P1		GEM-201	2TM-P1	
C63	.1	200	32143	P288N-1		DF-104	CUB2P1		GEM-601	5TM-P1	
C64	.047	200	32143	P288N-047		DF-503	CUB3547		GEM-4147	2TM-S47	
C65	10000		32089	BPD-01		DD-103	BYA5B1	ED-01	DC5D1	5HK-S1	
C66	.1	200	32143	P288N-1		DF-104	CUB2P1		GEM-601	5TM-P1	
C67	220	2000	32743	P288N-1		DF-104	CUD6P1		GEM-601	5TM-P1	10%③
C68	220	2000	32743								

1 Some versions may use 1000mmf (Part #23887) or 5000mmf (Part #23974) in this application.
2 Not used in some versions
3 Some versions may use 130mmf @ 3000V in this application.

CONTROLS

ITEM No	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESIST ANCE	WATTS	Packard-Bell PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No	MALLORY PART No	
R1A	1000Ω	½	25953 A	F1-7	RTV-844	+QU-1073	+UM-37688	Contrast
B	500K	½		R3-41				Volume
C	Switch			K9-1				
R2A	50K	½	25953	B-31	A47-50K-8	QU-123	U35	Brightness
B	Shaft			Not Req.	K38-3	Not Req.	Not Req.	
R3A	3meg	½	25954	B-84	A47-3meg-8	QU-140	U59	Vert. Hold
B	Shaft			Not Req.	K38-3	Not Req.	Not Req.	
R4A	5meg	½	25810	AB-87	A47-5meg-8	BU-141	PTA58L	Height
B	Shaft			AK-1	FK9-1/4	TMI-K21	Not Req.	
R5A	3meg	½	25867	AB-84	A47-3meg-8	BU-140	TA36L	Vert. Lin.
B	Shaft			AK-1	FK9-1/4	TMI-K21	Not Req.	
R6A	5meg	½	25810	AB-87	A47-5meg-8	BU-141	PTA58L	Focus
B	Shaft			AK-1	FK9-1/4	TMI-K21	Not Req.	
R7A	7.5meg	½	25911	AB-86	A47-7.5meg-8	BU-143	PTA788L	Pix Lock - Note 1
B	Shaft			AK-1	FK9-1/4	TMI-K21	Not Req.	
R8A	1meg	½	25915	BT-73	A47-P5-1meg	QU-137X	UT-434	Range-Tap ④330K-Note 1
B	Shaft			Not Req.	FK9-1/2	Not Req.	Not Req.	
R9A	50K	½	25908	BX-81	A47-50K-8	BU-125	PTA54L	Horiz. Drive
B	Shaft			AK-1	FK9-1/4	TMI-K21	Not Req.	

Note 1. In some versions R7 and R8 are combined in a dual control (Part #25926).
* #TA-LOC Equivalent, #7B13R, C8667, RU65A, BU167, UB-41.
+ Concentrikit Equivalent K-9 Kit, Base Elements & Shafts, BIT-109, P1-034 (Panel)
B13-133, R1-108 (Rear)
76-1 (Switch)

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		Packard-Bell PART No.	NOTES
	OHMS	WATT		
R10	2.2meg		73165	
R11	10K		73057	
R12	120Ω		73044	
R13	100Ω		73013	
R14	680		73012	
R15	12K		73039	
R16	120Ω		73024	
R17	150Ω		73025	
R18	68000		73035	
R19	10000		73035	
R20	270Ω		73018	
R21	1500Ω		73027	
R22	18000		73034	
R23	2.2meg		73165	
R24	56K		73046	
R25	2.2meg		73072	
R26	470K		73157	
R27	4700Ω	2	73053	
R28	180Ω		73016	
R29	4700Ω		73033	Note 1
R30	220K		73153	
R31	100K	1	73349	
R32	1meg		73161	
R33	33K		73043	
R34	3300Ω		73031	
R35	18K		73039	
R36	120Ω		73014	
R37	39K		73044	
R38	12K		73038	
R39	12K		73038	
R40	4.7meg		73169	
R41	220K		73153	
R42	220K		73153	
R43	470Ω		73052	Notes 1, 2
R44	6800Ω		73055	Note 1
R45	470K		73157	
R46	560Ω	2	73422	
R47	150K		73161	
R48	39K		73044	
R49	560K		73068	

ITEM No.	RATING		Packard-Bell PART No.	NOTES
	OHMS	WATT		
R50	22K	5	73650	
R51	82000	2	73436	
R52	2.2meg		73165	
R53	470K		73157	
R54	33K		73043	
R55	39K		73044	
R56	10K		73037	
R57	2.2meg		73165	
R58	68K		73047	
R59	33K		73041	
R60	68K		73047	Note 4
R61	220K		73153	Note 4
R62	2.2meg		73165	
R63	1meg		73161	
R64	470K		73157	
R65	1meg		73161	
R66	15K 5%		73038-1	
R67	1.5meg		73163	
R68	150K		73061	
R69	180Ω		73016	
R70	560Ω			
R71	560Ω			
R72	560Ω		73032	
R73	1meg		73061	
R74	1meg		73061	
R75	47K		73045	
R76	470K		73057	
R77	68000Ω		73035	
R78	2200Ω		73029	
R79	100K 5%		73049-1	
R80	180K		73051	
R81	620K		73060	
R82	820K		73060	
R83	330K		73021	
R84	15K	10	73705	
R85	12K	10	73705	
R86	10K		73057	
R87	1.8Ω	1	73706	
R88	3500Ω	10	73837	Note 5

Note 1. Not used in some versions.
Note 2. Some versions may use 1800Ω (Part #73028) in this application.
Note 3. Some versions may use 1. 5meg (Part #73063) in the application.
Note 4. Some versions may use 33K (Part #73043) in this application.
Note 5. Some versions may use 2500Ω, 30W (Part #73732) in this application.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA						NOTES
	PRI.	SEC. 1	SEC. 2	SEC. 3	Packard-Bell PART No.	Halloreon PART No.	Merit PART No.	Stancor PART No	Thordarson PART No	Triad PART No	
T1	117V	550VCT ①1.6A	5V ②. 370A	6.3V ③ 3A	29058E						

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No.	USE	REPLACEMENT DATA							NOTES
		Packard-Bell PART No.	Halloreon PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	Vert. Output	29434D	22606	A-3039	V312	A-8141	26854	A-104X	
T3A	Yoke-Horiz. (25MH)	29590C ①				QV-23A ②		T-44 &	
B	(90Ω) Vert. (31MH)							NW35	
M4	Rear Cover & Centering Device	34045A						CL-1 YC-1	
T4	Yoke Clamp Horiz. Output	75008 29455A	FB420*§ ③	HVO-54*§ ③	X129 *§ ③	HO-253*	FLY-76*§	D-121 *	

① Includes C67, R70 and R71.
② Use original rear cover, centering device and original horizontal damping network.
③ Drill new mounting hole(s).
§ This part may be superceded by Parts Manufacturer's introduction of special unit for this application.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

	ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
	8	5	5	5	8	5	8
	5	4	4	4	5	4	5
	4	See Note ① NC	See Note ② NC	See Note ③ NC	4	See Note ④ NC	2
	2	1	1	1	1	1	1
Special Notes		③	③	③		④	

① To reduce yoke "Ringing" install 1000Ω ⑤ 1W resistor in series with capacitor (C67).

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA					NOTES
	PRI.	SEC.	Packard-Bell PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T5	4700Ω 7600Ω	3-4Ω 3-4Ω	29435C 29466 ①	X1107 X1118 ②	A-2930 A-3080	A-8377 A-8378 ②	24831 26848	S-3X S-3X ② ②	① Used in Model 21R3 ② Drill new mounting hole.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	Packard-Bell PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	83014 ①	4A07	① Used in Models 21VT2, 24VT1, 21ST3
	6" x 9"	PM	3-4Ω	83112 ②	69A3	② Used in Models 21SC6, 21SC7, 21SC8, 24SC2
	4"	PM		83108 ③		③ Used in Model 21SK3
	4"	PM		83109 ③		
	10"	PM		83709 ③		

COILS (RF-IF)

ITEM No	USE	REPLACEMENT DATA					NOTES
		Packard-Bell PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	1st. Video IF	29584	17-4534	TV-131		VF-4	
L2	2nd. Video IF	29585	17-4532	TV-130	6219	VF-3	
L3	3rd. Video IF	29585	17-4532	TV-130	6219	VF-3	
L4	4th. Video IF	29587A	17-4523	TV-130	6219	VF-3	
L5	RF Choke	29596	19-1005	BC-596	4812		10 Microhenries
L6	RF Choke	29596	19-1005	BC-596	4812		10 Microhenries
L7	Series Peaking Coil	29608	19-4180	TV-183	6179	VP-5 *	180 Microhenries, wound on 39K resistor
L8	Series Peaking Coil	29552	19-3093 ▲	TV-181 ▲	6177 ▲	VP-3 ▲	93 Microhenries, wound on 3900Ω resistor
L9	4.5MC Trap	29548	17-5403 ▲	1470			Note 2
L10	Shunt Peaking Coil	29677	19-4400 †	TV-303 †	6138 †		400 Microhenries, wound on 18K resistor
L11	Sound IF	29053	20-1004	TV-151	1489	SV-3	Note 3
L12	Ratio Det.	29691	17-3477				

Note 1. Alternate part #29548A.
Note 2. Alternate part #29053B.
* Parallel with 39K resistor.

▲ Parallel with 3900Ω resistor.
+ Disregard tap.
† Parallel with 18K resistor.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES		REPLACEMENT DATA						NOTES
	PRI.	SEC.	Packard-Bell PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Thordarson PART No.	
L13	70Ω		29695 *	19-1576	TV-163	6180	H-102	HH-5	18-47 Microhenries * Alt. part #29696A.

FILTER CHOKE

ITEM No.	RATINGS			REPLACEMENT DATA					
	TOTAL DIRECT CURRENT	D.C. RESISTANCE	INDUCTANCE @ CURRENT 1000 $^{m}/_{s}$)	Packard-Bell PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No
L14	270A	38Ω	1 Hy.	27005B	C5037 ①	C-2996 ①	C-3336 ①	26C44 ①	C-34X

① Drill new mounting hole.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			Packard-Bell PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M1	N	3/4A 125V S/B	45040 ①		333, 750 (N 3/4A-125V S/B)		346010	N 3/4	HN 1/2 to 3/4
M2	1" piece of #26 wire.								

① Some versions may use ¾A S/B in this application (Part #45033).

MISCELLANEOUS

ITEM No.	PART NAME	Packard-Bell PART No.	NOTES
M3	Tuner	10591B	VHF
	Tuner	10559	UHF-VHF
M4	Centering Device	34045A	Includes yoke cover
M5	Ion Trap	21R63	

PACKARD-BELL MODELS 21SC6, 7, 8, 21SK3, 21ST3, 21VT2, 24SC2, 24VT1 (Ch. 885) and AM Tuner 31T3

FOLDER 2

PARTS LIST AND DESCRIPTIONS (Continued)

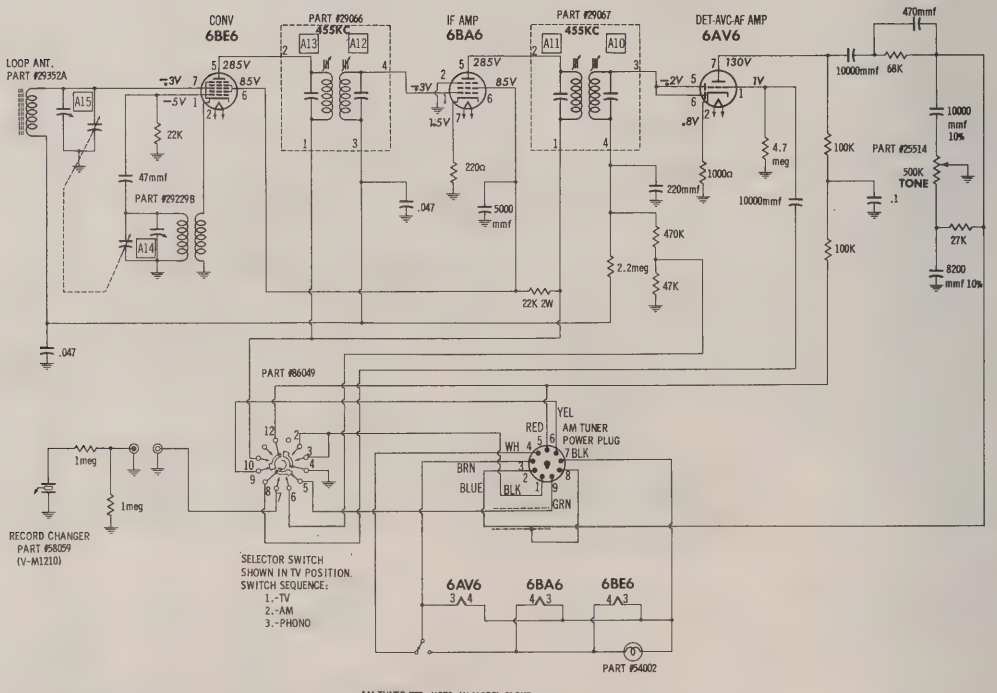
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Safety Glass	55090	21" Models
Safety Glass	55096A	24" Models
Mask	55091-1A	21" Models, Front Controls
Mask	55091-2A	21" Models, Side Controls
Mask	55097-1A	24" Models, Front Controls
Mask	55097-2A	24" Models, Side Controls
Knob	52208	Channel Selector - Models with front controls
Knob	52218	Channel Selector - Models with side controls
Knob	52209	Fine Tuning - Models with front controls
Knob	52219	Fine Tuning - Models with side controls
Knob	52211	On-off-volume - Models with front controls
Knob	52214A	On-off-volume - Models with side controls
Knob	52212A	Contrast - Models with front controls
Knob	52215A	Contrast - Models with side controls
Knob	52213	Brightness, vertical hold - Models with front controls
Knob	52216	Brightness, vertical hold - Models with side controls
Knob	52183A	Range

WIRING DATA

High Voltage Lead	Use BELDEN No.	8869
Shielded Hook-up Wire	Use BELDEN No.	8885 (Single Conductor)
		8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No.	8530 (Solid) Available in Ten Colors
		8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No.	8874
300Ω Tuner Input Lead	Use BELDEN No.	8225
300Ω Antenna Lead-in	Use BELDEN No.	8230 or 8275
Antenna Rotor Cable	Use BELDEN No.	8464 (Flat) or 8484 (Round) - 4 Conductor
		8485 (Round) - 5 Conductor
		8488 (Round) - 8 Conductor



A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

AM TUNER 3T3, USED IN MODEL 21SK3

AM TUNER SCHEMATIC

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CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Turn the set on and tune in a TV station, preferably with a test pattern.

Adjust the horizontal hold until the picture synchronizes horizontally. The proper setting for the horizontal hold is half-way between the two points where the picture starts to tear.

Adjust the horizontal drive control (R9) in a clockwise direction as far as possible without the presence of a vertical white line or compression near the center of the screen.

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DENVER, COLORADO

513-3

PHOTOFACT* Folder

*TRADE MARK

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

RCA VICTOR MODELS 17-D-8185, U, 17-D-8186, U, 17-D-8187, U, 17-PD-8093, U, 17-PD-8094, U, 17-PD-8099, U, 17-PT-8071, U, 17-PT-8072, U (Ch. KCS109A, B, C, D)

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 13 metal screws from the rear cover. Remove the rear cover.

2. Remove 6 push-on type knobs from the side.

3. Remove the hairpin clips from inside the cabinet holding the insulating discs on the tuner shafts.

4. Remove the speaker leads, picture tube socket, HV lead and loosen the yoke clamp.

5. Remove 1 hex nut and 2 metal screws from the upper chassis braces.

6. Remove 2 chassis bolts from the bottom.

7. Remove the chassis and yoke.

MODEL 17PT8071U (CH. KCS109B)

CAUTION NOTE

ONE SIDE OF AC LINE CONNECTED TO CHASSIS
Care should be exercised when connecting test equipment or physically contacting the chassis.

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RCA VICTOR MODELS 17-D-8185, U, 17-D-8186, U, 17-D-8187, U, 17-PD-8093, U, 17-PD-8094, U, 17-PD-8099, U, 17-PT-8071, U, 17-PT-8072, U (Ch. KCS109A, B, C, D)

TRADE NAME	RCA Victor	MODELS	CHASSIS
		17PT8071, 17PT8072	KCS109A
		17PT8071U, 17PT8072U	KCS109B
		17D8185, 17D8186, 17D8187, 17PD8093, 17PD8094, 17PD8096, 17PD8099	KCS109C
		17D8185U, 17D8186U, 17D8187U, 17PD8093U, 17PD8094U, 17PD8096U, 17PD8099U	KCS109D

MANUFACTURER	Radio Corporation of America, RCA Victor Tele. Div., Camden 8, N.J.
TYPE SET	Television Receiver
TUBES	Fifteen
POWER SUPPLY	110-120 Volts AC, 60 Cycle RATING 130 Watts, 1.2 Amp. @ 117 Volts AC
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of the VHF oscillator is possible by removing the channel selector, fine tuning knobs and the insulating disc. Remove the rear cover and remove the hairpin spring holding the insulating disc. Set the fine tuning at the center of its range. The adjustments (located in a circle around the shaft) should be made in sequence from the highest to the lowest channel in the area. Channel 13 adjustment is located at 3 o'clock, proceed in a counter clockwise direction adjusting for best picture and sound.

PICTURE TUBE SAFETY GLASS CLEANING

Remove 3 metal screws from the bottom of the front. Remove the front. Remove 4 spring clips holding the safety glass. Lift safety glass out.

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

The horizontal frequency coil is used as the horizontal hold control. Adjust the horizontal hold until the picture synchronizes horizontally. (For location, see tube placement chart).

FUSES

One fuse is used for horizontal sweep circuit protection. A 5.6Ω fusible resistor (R96) is used for LV power supply protection. (For location, see tube placement chart).

CENTERING

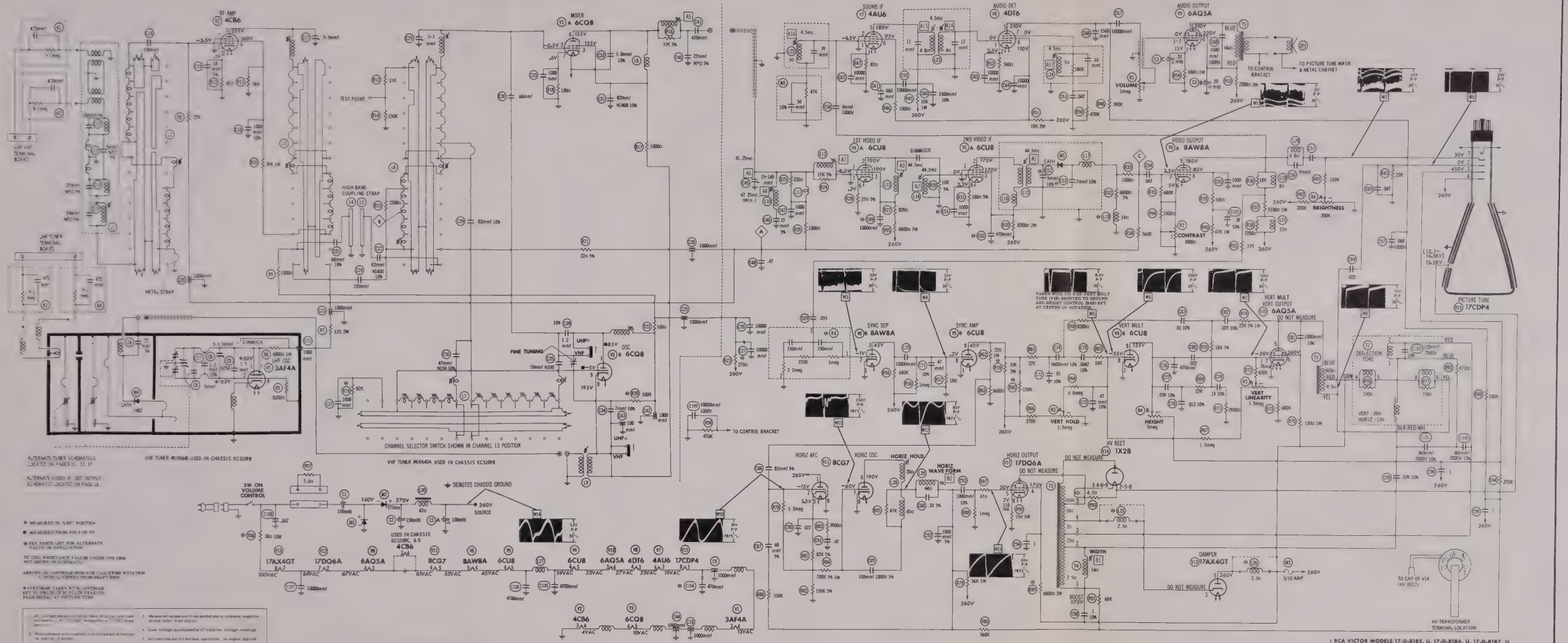
Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1958 Howard W. Sams & Co., Inc., Indianapolis 5, Indiana. Printed in U.S. of America

H353

FOLDER 3


RF AMP V2 4CB6
MIXER V3 A 6CQ8
SOUND IF V7 4AU6
AUDIO DET V8 4DT6
AUDIO OUTPUT V9 6AQ5A
1ST VIDEO IF V4 A 6CU8
GIMMICK
2ND VIDEO IF V5 A 6CU8
VIDEO OUTPUT V6 A 8AW8A
SYNC SEP V6 B 8AW8A
SYNC AMP V5 B 6CU8
VERT MULT V4 B 6CU8
VERT MULT VERT OUTPUT V10 6AQ5A
OSC V3 B 6CQ8
UHF OSC V1 3AF4A
HORIZ AFC V11 8CG7
HORIZ OSC
HORIZ HOLD
HORIZ WAVE FORM
HORIZ OUTPUT V12 17DQ6A
HV RECT V14 1X2B
DAMPER V13 17AX4GT
PICTURE TUBE V15 17CDP4
VOLUME
CONTRAST
BRIGHTNESS
VERT LINEARITY
VERT HOLD
HEIGHT
WIDTH
BOOST
FINE TUNING
TEST POINT
HIGH BAND COUPLING STRAP
METAL STRAP
CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 13 POSITION
VHF TUNER #KR46A USED IN CHASSIS KCS109B
UHF TUNER #KR46M USED IN CHASSIS KCS109B
TO CONTROL BRACKET
TO PICTURE TUBE MASK & METAL CABINET
DO NOT MEASURE
DENOTES CHASSIS GROUND
SW ON VOLUME CONTROL
260V SOURCE
USED IN CHASSIS KCS109C, & D
4CB6
17AX4GT 17DQ6A 6AQ5A 8CG7 8AW8A 6CU8 6CU8 6AQ5A 4DT6 4AU6 17CDP4
4CB6 6CQ8 3AF4A
ALTERNATE TUNER SCHEMATICS LOCATED ON PAGES 11 12 17
ALTERNATE VIDEO IF DET OUTPUT SCHEMATIC LOCATED ON PAGE 18
A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

RCA VICTOR MODELS 17-D-8185, U, 17-D-8186, U, 17-D-8187, U, 17-PD-8093, U, 17-PD-8094, U, 17-PD-8099, U, 17-PT-8071, U, 17-PT-8072, U (Ch. KCS109A, B, C, D)

TUBE PLACEMENT CHART

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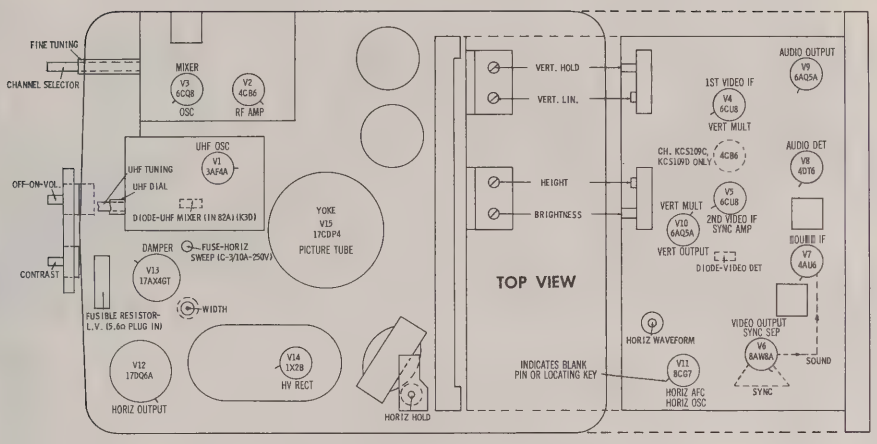


TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

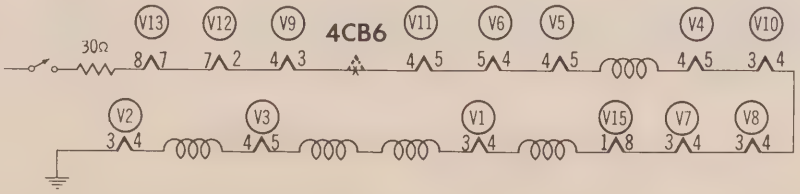
POWER SUPPLY FAILURE
No raster, no sound - **Fusible Resistor (R97), Rectifier (M1, M2)**

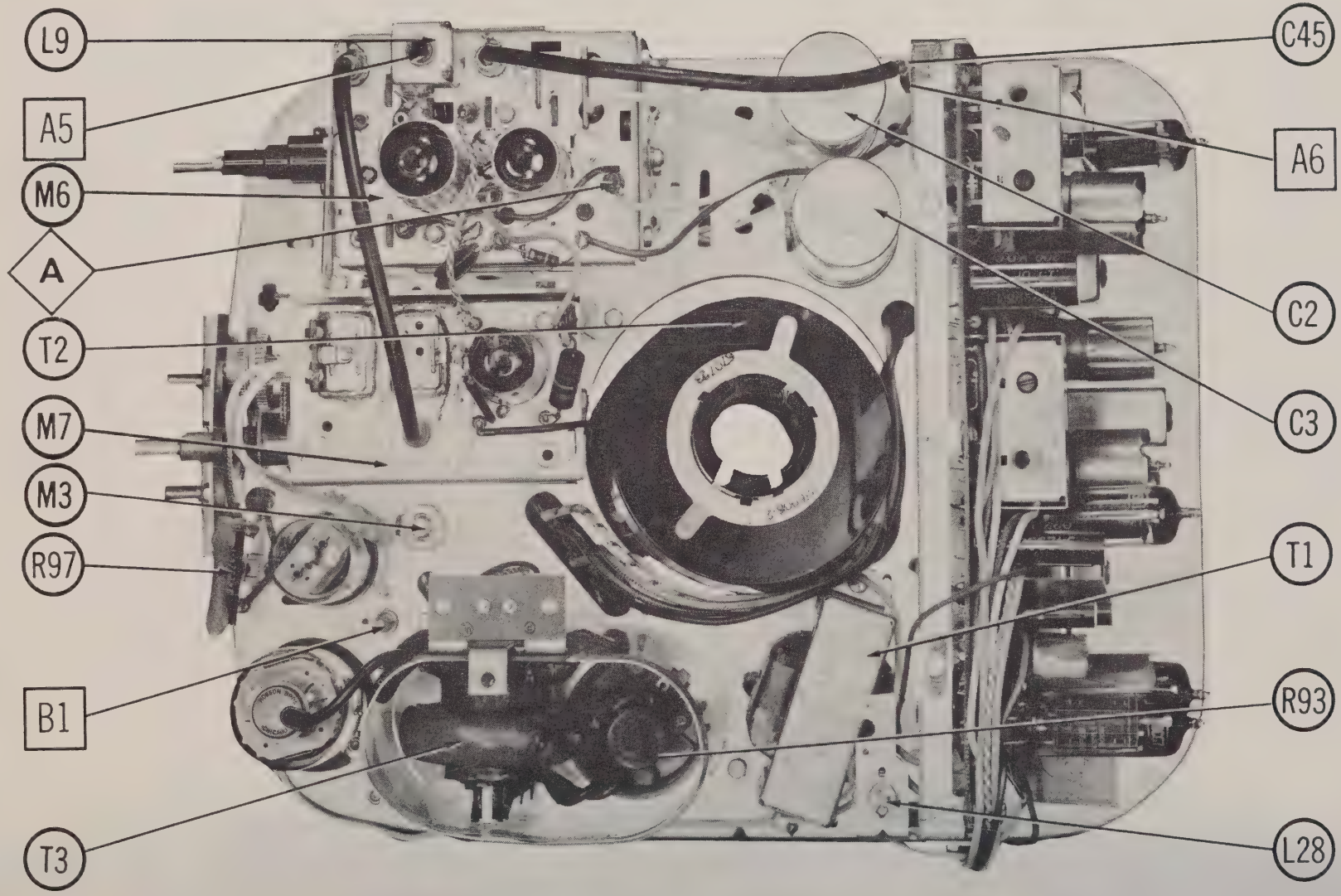
LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V4, V5, Diode (M5), V6**
No pic, no sound, has snow - **V2, V3, (V1 UHF only)**
No pic, has sound, has raster - **V6, V15**
Has pic, no sound - **V7, V8, V9**

SYNC FAILURE
No vert. sync - **V6, V5**
No horiz. sync - **V6, V5, V11**
No vert. or horiz. sync - **V6, V5**

SWEEP FAILURE
No raster, has sound - **Fuse (M3), V11, V12, V13, V14, V15**
No vertical deflection - **V4, V10**
Poor vert. linearity or foldover - **V4, V10**
Poor horiz. linearity or foldover - **V11, V12, V13**
Narrow picture - **V11, V12, V13, M1, M2**
Vert. off freq. - **V4, V10**
Horiz. off freq. - **V11**

This receiver employs tubes used in a series filament network, an open filament in any tube in the series will cause the set to be inoperative. (See circuit below).





CHASSIS TOP VIEW

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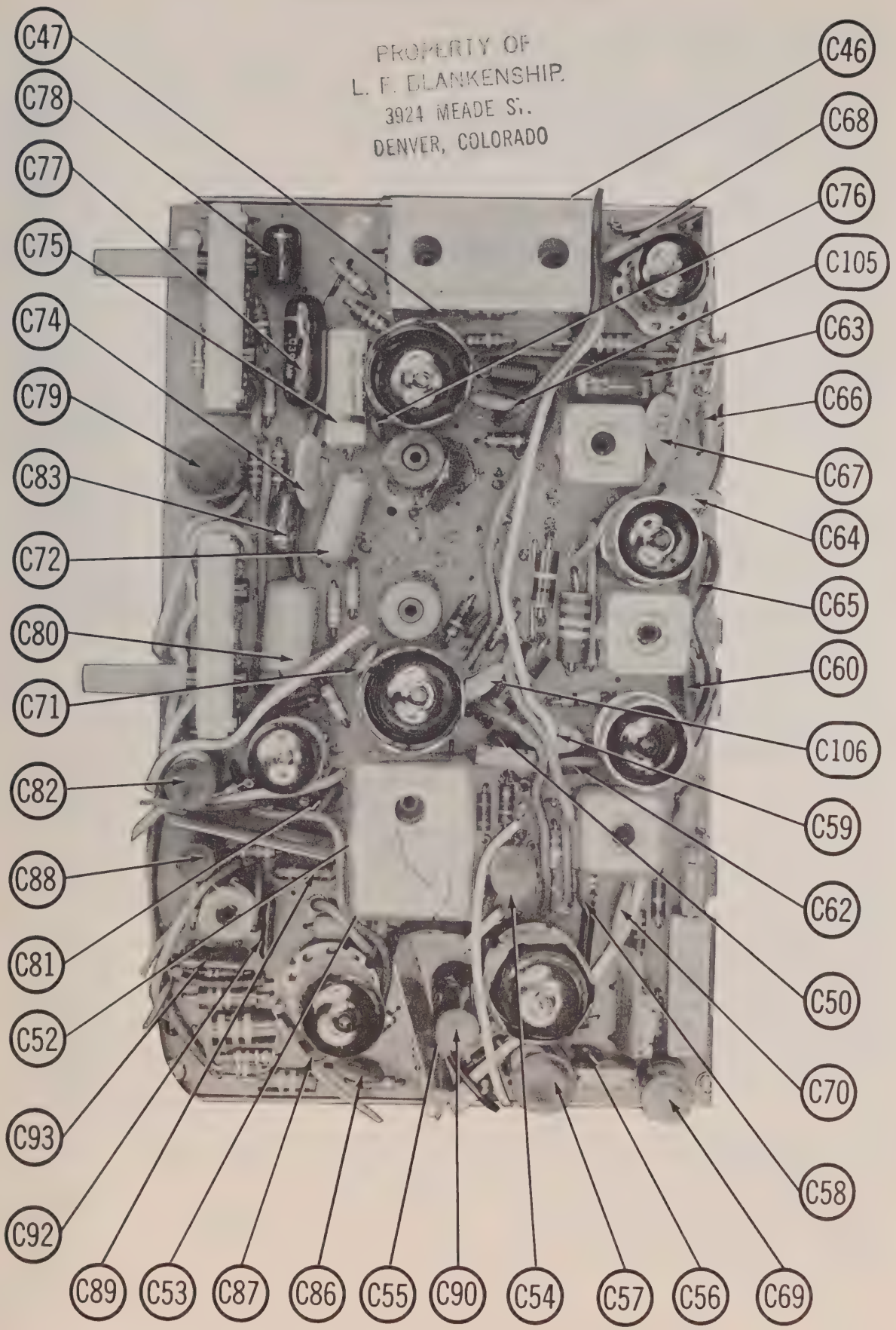


CAPACITOR IDENTIFICATION

SET 392 FOLDER 3

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

USE AN ISOLATION TRANSFORMER TO PROTECT THE TEST EQUIPMENT.
The high voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.

VIDEO IF ALIGNMENT FOR CHASSIS KCS109A AND KCS109B

Connect the negative lead of a 4 volt bias supply to point (A). Positive to chassis.
Use only enough generator output to provide a usable indication on VTVM.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	1500mmf Ceramic Capacitor	High side to point (B). Low side to chassis.	44.5MC	Any non-interfering channel	DC probe thru 10K to point (C). Common to chassis.	A1, A2, A3	Adjust for maximum deflection.
2.	"	"	47.25MC	"	"	A4	Adjust for MINIMUM deflection.

OVERALL VIDEO IF RESPONSE CHECK FOR CHASSIS KCS109A AND KCS109B

Connect bias as under "Video IF Alignment".
Remove the 1st. video IF amplifier tube (V4) from its socket and plug an adapter in its socket. Plug V4 in the adapter socket.
Connect a 180Ω resistor from pin 2 to pin 3 of the adapter socket.
If a separate marker generator is used, couple loosely to the high side of the sweep generator output lead.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
3.	1500mmf Ceramic Capacitor	High side to point (B). Low side to chassis.	44.0MC (10MC Swp)	42.5MC 45.75MC	Any non-interfering channel	Vert. Amp. thru detector probe to pin 2 of adapter socket. Low side to chassis.	A5, A6, A7	Adjust for maximum gain and symmetry of response similar to Fig. 1 with markers as shown. Remove adapter socket and replace V4 in its socket.
4.	"	"	"	42.5MC 45.0MC 45.75MC	"	Vert. Amp. to point (C). Low side to chassis.		Check for response similar to Fig. 2. If necessary, retouch A1, A2 and A3 for desired results.
5.	Fig. 3	High side thru pad (Fig. 3) to point (B). Low side to chassis.	Not used	45.75MC	"	USE VTVM. DC probe to point (C). Common to chassis.		Adjust generator output to produce exactly 1.5 volts on VTVM.
6.	1500mmf	High side to point (B). Low side to chassis.	"	41.25MC	"	"	A6	Adjust for 1.2 to 1.5 volts on VTVM. Recheck response curve as in step 4.

VIDEO IF ALIGNMENT FOR CHASSIS KCS109C AND KCS109D

Connect the negative lead of a 4 volt bias supply to point (D). Positive to chassis.
Use only enough generator output to provide a usable indication on VTVM.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
1.	1500mmf Ceramic Capacitor	High side to point (B). Low side to chassis.	44.5MC (Unmod)	Any non-interfering channel	DC probe thru 10K to point (E). Common to chassis.	A8	Adjust for maximum deflection.
2.	"	"	45.5MC	"	"	A9	"
3.	"	"	43.0MC	"	"	A10	"
4.	"	"	47.25MC	"	"	A11	Adjust for MINIMUM deflection.

OVERALL VIDEO IF RESPONSE CHECK FOR CHASSIS KCS109C AND KCS109D

Connect bias as under "Video IF Alignment".
Remove the 1st. video IF amplifier tube from its socket and plug an adapter in its socket. Plug the tube in the adapter. Connect 180Ω resistor from pin 2 to pin 3 of the adapter.
If a separate marker generator is used, couple loosely to the high side of the sweep generator output cable.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
The sweep generator output lead should be terminated with its characteristic impedance, usually 50 ohms.
Use only enough sweep generator output to provide a usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
5.	1500mmf Ceramic Capacitor	High side to point (B). Low side to chassis.	44.0MC (10MC Swp)	42.5MC 45.75MC	Any non-interfering channel	Vert. Amp. thru detector probe to pin 2 of adapter socket. Low side to chassis.	A5, A12, A13	Adjust for maximum gain and symmetry of response similar to Fig. 4 with markers as shown. Remove adapter socket and replace the 1st. video IF amp. in its socket.
6.	"	"	"	42.5MC 45.0MC 45.75MC	"	Vert. Amp. to point (E). Low side to chassis.		Check for response similar to Fig. 5. If necessary, retouch A8, A9 and A10 for desired response.
7.	Fig. 3	High side thru pad (Fig. 3) to point (B). Low side to chassis.	Not used	45.75MC	"	USE VTVM. DC probe to point (E). Common to chassis.		Adjust generator output to produce exactly 1.5 volts on VTVM.
8.	1500mmf Ceramic Capacitor	High side to point (B). Low side to chassis.	"	41.25MC	"	"	A8, A10	Retouch for 1.2 to 1.5 volts on VTVM. Recheck step 6.

ALIGNMENT INSTRUCTIONS (cont)

SOUND IF ALIGNMENT

Connect the negative lead of a 10 volt bias supply to point (A) or (D). Positive to chassis.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
9.	.001mfd	High side to point (C). Low side to chassis.	4.5MC (Unmod)	Any non-interfering channel	DC probe thru diode probe (Fig. 6) to pin 7 (screen) of 4DT6 (V8). Common to chassis. Connect scope across voice coil of speaker.	A14, A15	Adjust for maximum negative DC voltage on VTVM. Use only enough generator output to provide a usable indication on VTVM. Peak with maximum core separation.
10.	"	"	"	"	"	A16	Adjust for maximum negative DC voltage on VTVM. Use only enough generator output to provide a usable indication on VTVM.
11.	Disconnect the diode detector circuit. Turn off signal generator and tune in the strongest TV signal in the area. Adjust volume control for normal volume. Set A17 so that cores are flush with top of form. Observe scope and listen to sound. Adjust A17 clockwise to peak output. Continue clockwise to second louder peak and adjust for maximum output at this second peak.						

ALTERNATE SOUND IF ALIGNMENT USING FM GENERATOR

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	CHANNEL	CONNECT VTVM	ADJUST	REMARKS
9.	.001mfd	High side to point (C). Low side to chassis.	4.5MC (Unmod)	Any non-interfering channel	DC probe thru 10K to point (E). Common to chassis.	A14, A15	Adjust for maximum negative DC voltage on VTVM. Use only enough generator output to provide a usable indication on VTVM. Peak with maximum core separation.
10.	"	"	"	"	"	A16	Adjust for maximum negative DC voltage on VTVM. Use only enough generator output to provide a usable indication on VTVM.
11.	"	"	4.5MC (400~ FM 15KC Swp)	"	Use scope across voice coil of speaker.	A17	Adjust for maximum 400~ indication on scope. Use only enough signal to produce .7 volt peak to peak on the scope when A17 is peaked.
12.	"	"	"	"	"		Decrease the input signal to MINIMUM usable signal and retouch A14, A15 and A16 for symmetrical break-out similar to Fig. 7.

TUNER ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.

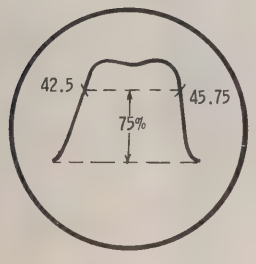


FIG. 1

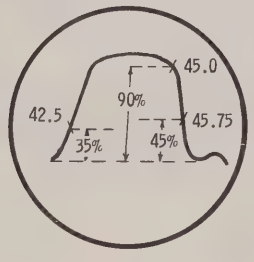


FIG. 2

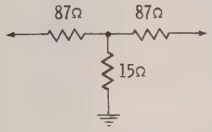


FIG. 3

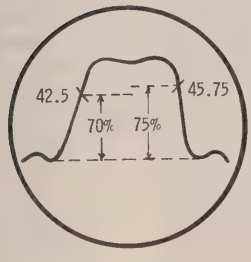


FIG. 4

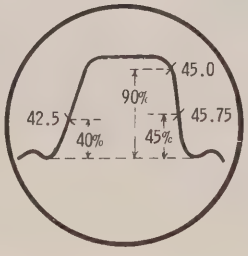


FIG. 5

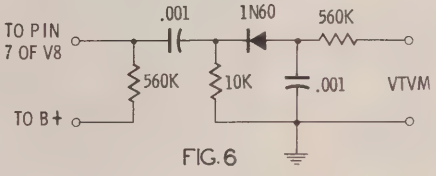


FIG. 6

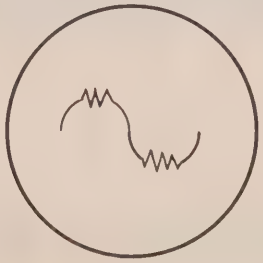
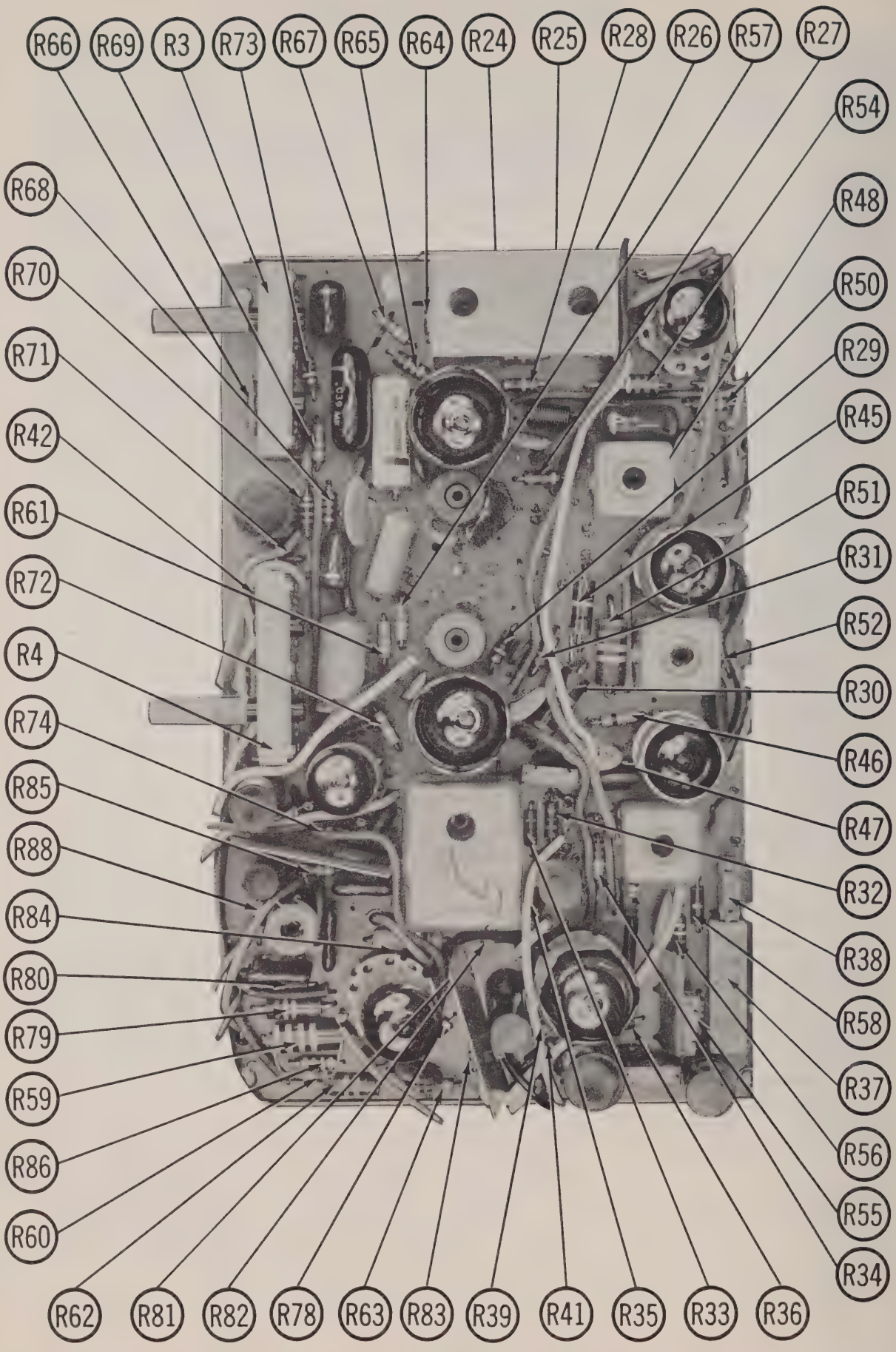


FIG. 7

RCA VICTOR MODELS 17-D-8185, U, 17-D-8186, U, 17-D-8187, U, 17-PD-8093, U, 17-PD-8094, U, 17-PD-8099, U, 17-PT-8071, U, 17-PT-8072, U (Ch. KCS109A, B, C, D)

FOLDER 3



RESISTOR IDENTIFICATION

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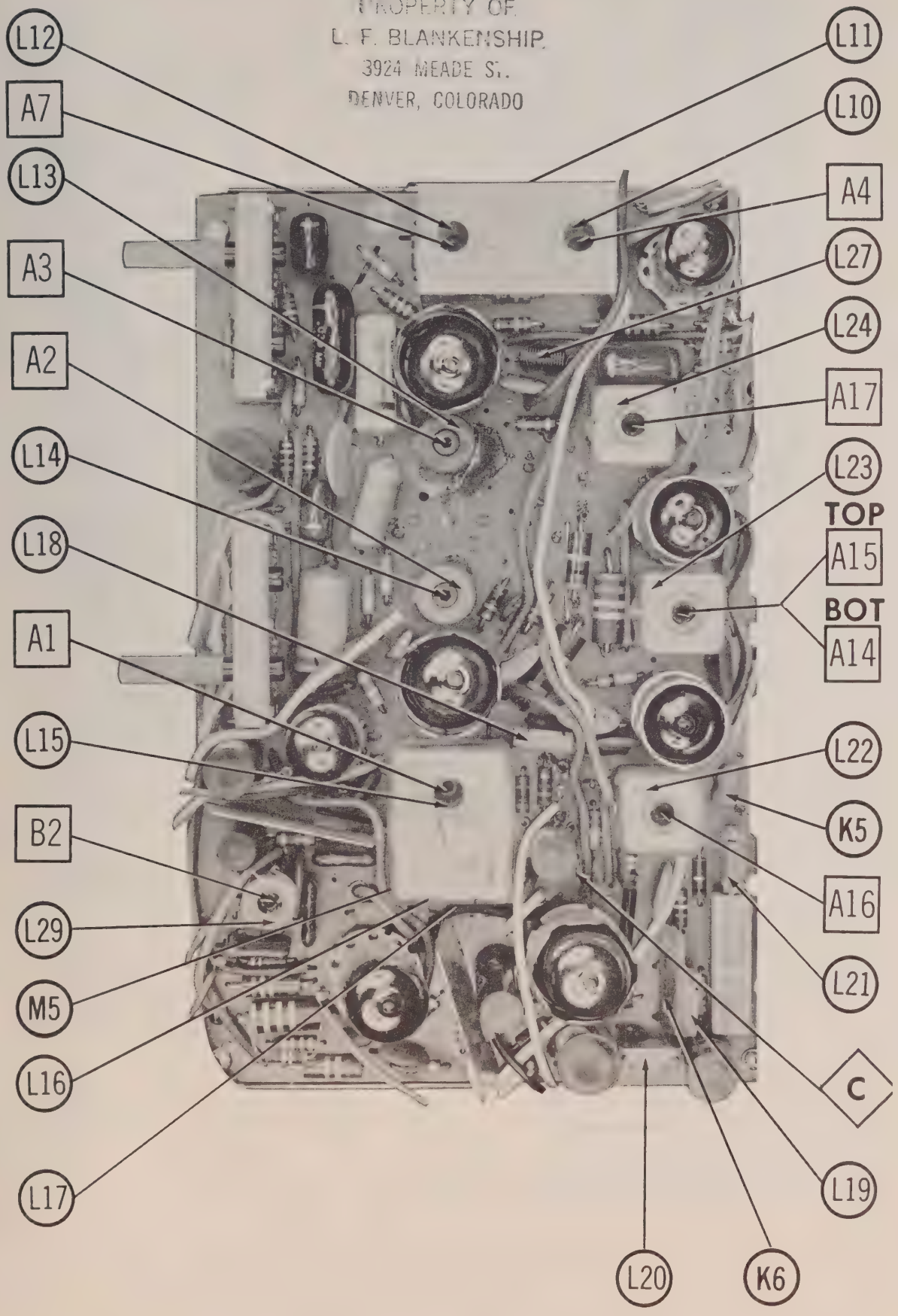
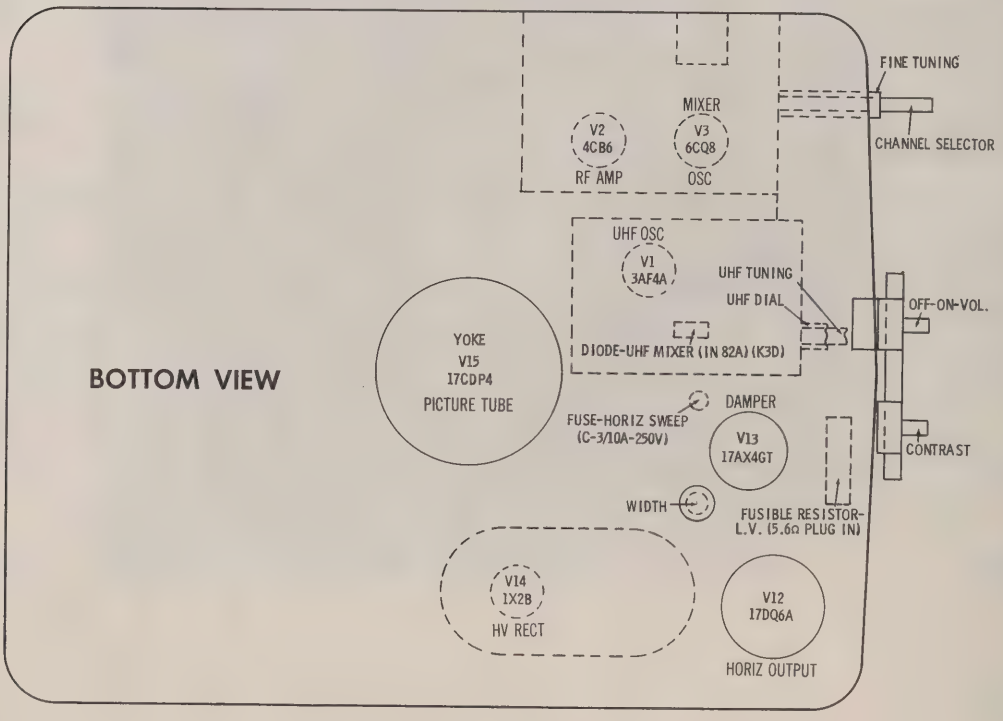


INDUCTOR AND ALIGNMENT IDENTIFICATION

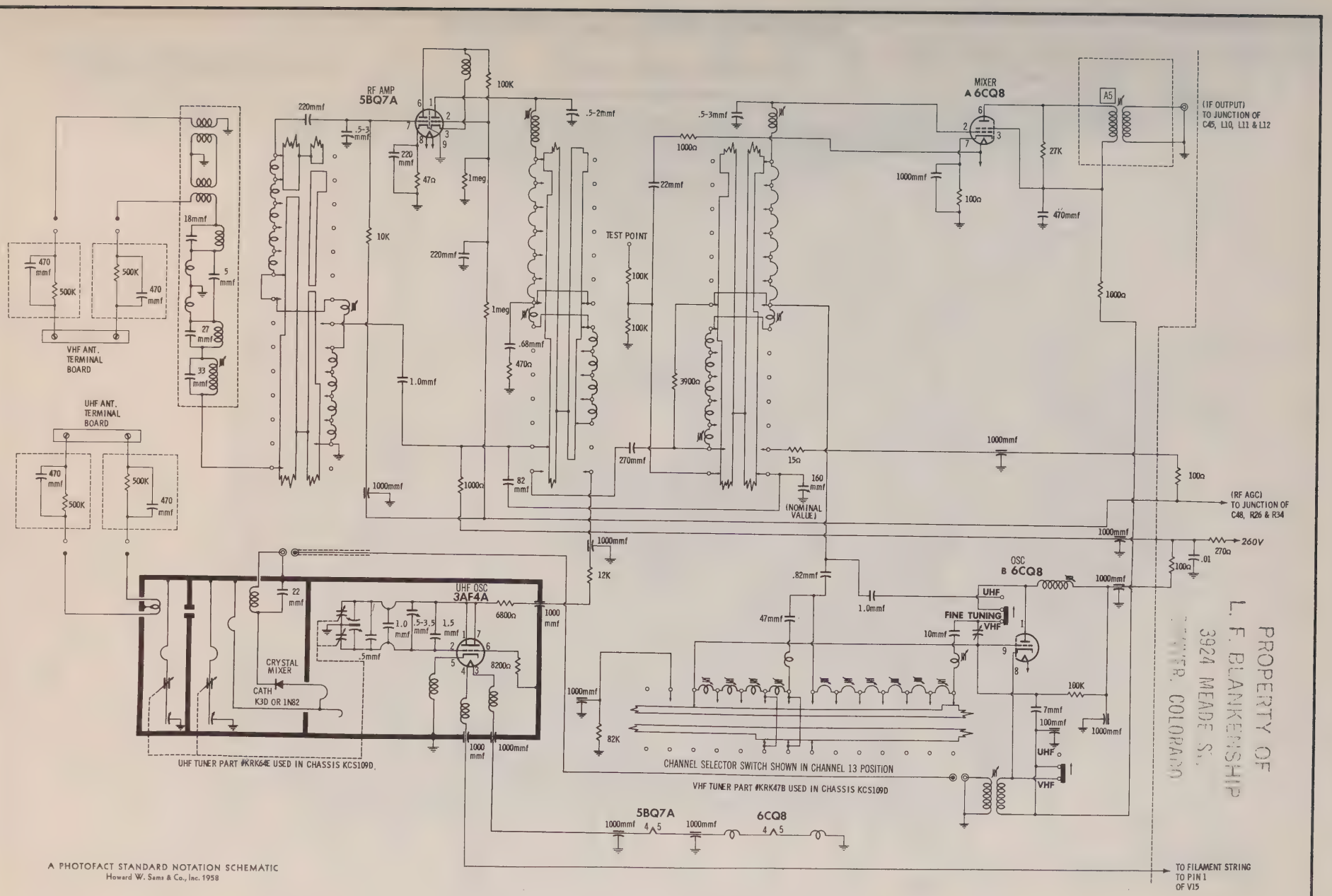
RESISTANCE MEASUREMENTS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	3AF4A	†*15K	8200Ω	2Ω	2.5Ω	.1Ω	8200Ω	†*15K		
V2	4CB6	590K	47Ω	0Ω	1Ω	†1300Ω	†25K	0Ω		
V3	6CQ8	†370Ω	160K	INF	1Ω	2Ω	INF	100Ω	INF	†100K
V4	6CU8	0Ω	†7600Ω	†7600Ω	12.5Ω	10.5Ω	27Ω	570K	• 2.3meg	• ‡2.5meg
V5	6CU8	0Ω	†8200Ω	†8200Ω	14.5Ω	12.5Ω	180Ω	.1Ω	18K	†18K
V6	8AW8A	0Ω	3.2meg	†680K	14.5Ω	17Ω	• 190Ω	680K	†47K	†5100Ω
V7	4AU6	47K	0Ω	6.5Ω	7.5Ω	†10K	†10K	82Ω		
V8	4DT6	4Ω	560Ω	7.5Ω	8.5Ω	‡490K	†18K	470K		
V9	6AQ5A	0Ω	680Ω	20Ω	21Ω	†2500Ω	†2200Ω	0Ω		
V10	6AQ5A	• 1.3meg	0Ω	10.5Ω	8.5Ω	†470Ω	†150Ω	• 1.3meg		
V11	8CG7	†0Ω	1.3meg	230K	20Ω	17Ω	†56K	250K	0Ω	0Ω
V12	17DQ6A	NC	21Ω	NC	†6800Ω	1meg	TP	24Ω	15Ω	TOP CAP ‡18Ω
V13	17AX4GT	NC	NC	¶	NC	†2.3Ω	NC	24Ω	27Ω	
V14	1X2B	PINS 1 THRU 9 HAVE INFINITE RESISTANCE								TOP CAP ‡326Ω
V15	17CDP4	4.5Ω	22K	‡330K	†0Ω	NC	NC	• 180K	6.5Ω	

¶ THIS READING CAN VARY GREATLY, (10K MINIMUM), DUE TO THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.
• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
* MEASURED IN "UHF" POSITION.
† MEASURED FROM 260V SOURCE .
‡ MEASURED FROM PIN 3 OF V13.
NC NO CONNECTION
TP TIE POINT



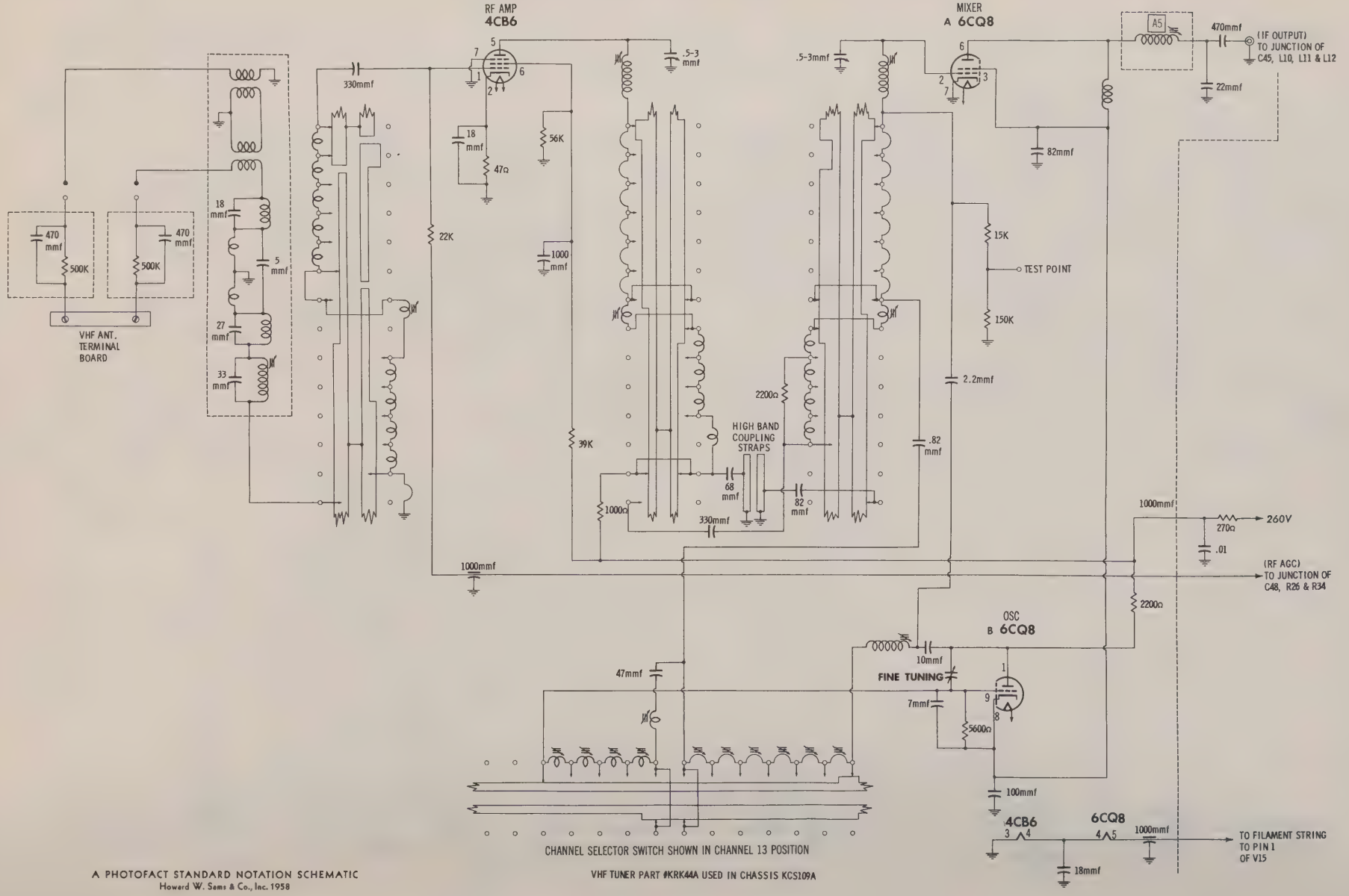
TUBE PLACEMENT CHART


RF AMP 5BQ7A
MIXER A 6CQ8
OSC B 6CQ8
UHF OSC 3AF4A
CRYSTAL MIXER
CATH K3D OR 1N82
VHF ANT. TERMINAL BOARD
UHF ANT. TERMINAL BOARD
TEST POINT
(IF OUTPUT) TO JUNCTION OF C45, L10, L11 & L12
(RF AGC) TO JUNCTION OF C48, R26 & R34
(NOMINAL VALUE)
260V
FINE TUNING
UHF
VHF
CHANNEL SELECTOR SWITCH SHOWN IN CHANNEL 13 POSITION
UHF TUNER PART #KRK64E USED IN CHASSIS KCS109D
VHF TUNER PART #KRK47B USED IN CHASSIS KCS109D
5BQ7A
6CQ8
TO FILAMENT STRING TO PIN 1 OF V15
A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

ALTERNATE UHF-VHF TUNER SCHEMATIC

RCA VICTOR MODELS 17-D-8185, U, 17-D-8186, U, 17-D-8187, U,
17-PD-8093, U, 17-PD-8094, U, 17-PD-8099, U, 17-PT-8071, U,
17-PT-8072, U (Ch. KCS109A, B, C, D)



A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

ALTERNATE VHF TUNER SCHEMATIC

CHASSIS BOTTOM VIEW

RCA VICTOR MODELS 17-D-8185, U, 17-D-8186, U, 17-D-8187, U, 17-PD-8093, U, 17-PD-8094, U, 17-PD-8099, U, 17-PT-8071, U, 17-PT-8072, U (Ch. KCS109A, B, C, D)

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	UHF Osc	3AF4A	
V2	RF Amplifier	4CB6	
V3	Mixer-Osc.	6CQ8	
V4	1st. Video IF Amp - Sync Amp	6CU8	
V5	2nd. Video IF Amp - Sync Amp	6CU8	
V6	Video Output -Sync Sep	8AW8A	
V7	Sound IF Amp	4AU6	
V8	Audio Det	4DT6	
V9	Audio Output	6AQ5A	
V10	Vert Mult -Vert Output	6AQ8A	
V11	Horiz AFC-Horiz Osc	8CG7	
V12	Horiz Output	17DQ6A	
V13	Damper	17AX4GT	
V14	HV Rectifier	1X2B	

PICTURE TUBE

ITEM No.	REPLACEMENT DATA				NOTES
	RCA Victor PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	SYLVANIA PART No.	
V15	17CDP4		17CDP4		1 Silvermas

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP	RATING VOLT	REPLACEMENT DATA RCA Victor PART No.	AEROVOX PART No.	CORNELL DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.	NOTES
C1	150	300	100383	PR3-400	BBRD0334	WO425	CDB-D-1014	S-200	TVL-1643	
C2	150	350	100042	AFRD-43-20	XAD418	TP228.5	TMD-81	S-233	TVL-1642	
C3A	100	350	104194	AFRH-58-60	D0473 3	FP420.23	TMQ-69	Q-280	R2559 *	
B	430	350								
C	420	25								

* Non-catalog item

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP	RATING VOLT	REPLACEMENT DATA RCA Victor PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C4	33		104185		TCZ-33		TCO-33			5%
C5	3.5		102978							NT50 ± 25 mmf
C6	5-3.5						532-2			
C7	2.0		104186	NPO-SI 1.0	TCZ-1		TCO-1		STCCB-V1	10%
C8	5		104187		TCZ-R5		TCO-.5			
C9	2000		103997	EF-001	MFT-1000					
C10	2000		103997	EF-001	MFT-1000				503C-D1	
C11	1000		103997	EF-001	MFT-1000				503C-D1	
C12	18		103646		TCZ-18	C10C18C	TCO-18			5%
C13	5		103577	NPO-SI 5	TCZ-4R7	C10Y5C	TCO-5			NPO 5%
C14	27		100351		TCZ-27	C10Q27C	TCO-27			NPO 5%
C15	33		103573		TCZ-33	C10Q33C	TCO-33			NPO 5%
C16	330		102089	BPD-00033	DD-331	L10T33	ED-330	UC-5333	SGA-T33	
C17	3-3		104053		529-3		515-E	CT565A		
C18	3000		77252			1R5DI	ED-1000	MC8355	MS-SI	10%
C19	18		103133		TCZ-18	C10Q18C	TCO-18			5%
C20	1000		103217	EF-001	MFT-1000				503C-D1	
C21	68		104829	NPO-DI 68	TCZ-68	L10Q68	ED-68		STCC-Q68	10%
C22	83		78603							N1400 10%
C23	1000		103217	EF-001	MFT-1000				503C-D1	
C24	330		103089	BPD-00033	DD-331	L10T33	ED-10	UC-5333	SGA-T33	
C25	1000		103217	EF-001	MFT-1000				503C-D1	
C26	10000		73960	BPD-01	DD-103	BYA6SI	ED-01	DC511	SHK-SI	
C27	10000		73960	BPD-01	DD-103	BYA6SI	ED-01	DC511	SHK-SI	①
C28	1000		103217	EF-001	MFT-1000				503C-D1	
C29	5-3		104053		529-3		515-E	CT565A		
C30	68				TCZ-R68		TCO-.68			
C31	82		78603							N1400 10%
C32	3.0		78833	NPO-SI 1	TCZ-1		TCO-1		STCCB-V1	10%
C33	1000		77383	BPD-001	DD-102	BYA6DI	ED-1000	DC521	SHK-DI	
C34	T		103183			C10VTC				10%
C35	10		103586							N330
C36	47		103585							N150 10%
C37	1000		77252	BPD-001	DD-103	BYA6DI	ED-1000	DC521	SHK-DI	
C38	5.2		78599							10%
C39	82		77680							10% NPO 5%
C40	82		104082		TCZ-23		TCO-23			
C41	470		78833	BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	SGA-T47	
C42	1000		103217	EF-001	MFT-1000				503C-D1	
C43	100		103516	EF-001	MFT-100				503C-T1	
C44	1000		103217	EF-001	MFT-1000				503C-D1	
C45	15-45		104388							
C46	25		104309		TCZ-15	52R5Q5	TCO-15	MS-415	5%	
C47	1000		77383	BPD-001	DD-103	BYA6DI	ED-1000	DC521	SHK-DI	
C48	47	200	104382	P288N-47		CUB23P47		GEM-2047	2TM-P47	
C49	1000		77383	BPD-001	DD-103	BYA6DI	ED-1000	DC521	SHK-DI	②
C50	470		78833	BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	SGA-T47	
C51	1000		77383	BPD-001	DD-103	BYA6DI	ED-1000	DC521	SHK-DI	
C52	8		104178	NPO-DI 8	TCZ-4.7	C10Y5C	TCO-5	ET-555	STCCB-V5	10%
C53	T		104177			C10VTC		ACM2147	2SK-847	10%
C54	.047	200	104310	P288N-047		BC2S47				
C55	1000		77252	BPD-001	DD-102	BYA6DI	ED-1000	DC521	SHK-DI	
C56	9		104311			C10YSC		ACM2401	4SK-P10	
C57	1	400	104312	P488N-1		BC5P1J				
C58	3	1000	104304	BPD-01	DD-103	BYA6SI	ED-01	DC511	SHK-SI	
C59	10000		73960	BPD-01	DD-103		ED-01	DC511	SHK-SI	
C60	3300		104305			1R5D53	CT30C3323		MS-333	10%
C61	3300		104305	BPD-00068	DD-682	BYAU0T68	ED-680	UC-5368	SGA-T68	
C62	10000		73960	BPD-01	DD-103	BYA6SI	ED-01	DC511	SHK-SI	
C63	.047	200	104306	P288N-047		CUB23P47		GEM-4147	2TM-S47	
C64	10000		73960	BPD-01	DD-103	BYA6SI	ED-01	DC511	SHK-SI	
C65	10000		73960	BPD-01	DD-103	BYA6SI	ED-01	DC511	SHK-SI	
C66	3300		104307	BPD-0015	DD-152	BYA10D15	ED-1500	DC5215	SHK-DI5	
C67	10000		73960	BPD-01	DD-103	BYA6SI	ED-01	DC511	SHK-SI	
C68	3300	1000	104308	P488N-032		BC2S32J			8SE-S33	
C69	.033	600	104313	P488N-033						
C70	10000		73960	BPD-01	DD-103	BYA6SI	ED-01	DC511	SHK-SI	
C71	47		102283	MPD-DI 47	DD-470	L10Q47	ED-47	GEM-4521	STCC-Q47	10%
C72	1.01	600	102284A							10%
C73	47		102282	MPD-DI 47	DD-470	L10Q47	ED-47		STCC-Q47	10%
C74	5600		104495			1R5D68	CT30C5623C	GEM-4547	MS-256	10%
C75	.0047	600	73935							
C76	470		77293	BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	SGA-T47	
C77	039	600	104491					GEM-4634		10%
C78	012	600	104493							10%
C79	.15	200	104494							10%

CAPACITORS (cont)

ITEM No.	RATING		REPLACEMENT DATA RCA Victor PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
	CAP	VOLT								
C80	.022	600	104145	P488N-022	DD-308	CUB4S23	ED-02	GEM-4123	8TM-S22	
C81	1000		104322			1R5DA	ED-1000	MC8295	MS-SI	10%
C82	.027	600	104330							10%
C83	.01	600	104418					GEM-1511		10%
C84	.012	600	103351A	P488N-022	DD-308	CUB4S22	ED-02	GEM-4122	8TM-S22	
C85	.047	200	104133	P288N-047		DF-503	CUB23P47	GEM-4147	2TM-S47	
C86	82		104314			TCZ-82	529S282	TCO-82	MS-482	5%
C87	68		104334			TCZ-68	529S268	TCO-68	MS-468	5%
C88	.01	600	104327							5%
C89	330	1000	104335							5%
C90	.022	400	104223	P488N-022	DD-308	CUB4S23	ED-02	GEM-4123	8TM-S22	
C91	.47	200	104382	P288N-47		CUB23P47		GEM-2047	2TM-P47	
C92	1000		104326	1464-001		1R5DI	CY15C103J	ED-1000	MC8355	5%
C93	1000		104326	1464-001		1R5DI			MS-SI	10%
C94	.1	600	104341	P568N-1	DF-104	CUB4P1			GEM-4101	
C95	.1	400	104487	P488N-1	DF-104	CUB4P1			GEM-401	WTM-P1
C96	.1	600	104487	P488N-1	DF-104	CUB4P1			GEM-401	WTM-P1
C97	.068	1000	73815	P568N-068		CUB0S68			GEM-1068	DTM-S68
C98	.1	600	73567							10%
C99	.039	400	73790						GEM-1634	10%
C100	280	3000	103781							10%
C101	280	3000	103781							10%
C102	120	3500	103535							10%
C103	39	400	103034A							10%
C104	470		78833		BPD-00047	DD-471	BYA10T47	ED-470	UC-5347	SGA-T47
C105	4700		73473		BPD-0047	DD-472	BYA10T47	ED-0047	UC-5347	SGA-D47
C106	4700		73473		BPD-0047	DD-472	BYA10C47	ED-0047	UC-5347	SGA-D47
C107	10000		73960		BPD-01	DD-103	BYA6SI	ED-01	DC511	SHK-SI
C108	.047	600	73592		P568N-047	DF-503	CUB6S47		GEM-6147	ETM-S47
C109	10000	1000	100910		DAC-27		BYA10S1M		GEM-1011	B1-S10

① Not used in some versions.
② Some versions use 470mmf (Part #78622) in this application.

CONTROLS

ITEM No	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA RCA Victor PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1meg	1	104196	B-70-8	A47-1meg-E	Q13-137	U33	Volume
B	Shaft			Not Req.	FB-3	Not Req.	Not Req.	
C	Switch			Not Req.	SWS-13	TS-1	U8-28	
R2	3000Ω	½	104484	B-13		Q37-113	U9	Contrast
R3A	1.5meg	½	104309					Vert. Hold
B	1.5meg	½						Vert. Lin.
R4A	200K	½	104202					Brightness
B	5meg	½						Height

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	RCA Victor PART No.	NOTES
R5	8200Ω		502282	
R6	6800Ω	1	512265	
R7	12K	2	512312	
R8	22K		502322	
R9	1000Ω		502210	
R10	39K	1	512339	
R11	56K		502356	
R12	470		502047	
R13	15K		502315	
R14	150K		502415	
R15	2200Ω		502222	
R16	33K 5%		502333	
R17	1000Ω		502210	
R18	100K		502310	Note 1
R19	82K			Note 2
R20	100K			
R21	220 5%		503023	
R22	100Ω		502110	
R23	270Ω		502127	
R24	15K 5%		502315	
R25	220Ω		502122	
R26	1000Ω		502210	
R27	820Ω		502182	
R28	270 5%		503027	
R29	10K 5%		502310	
R30	8200Ω	2	522283	
R31	820Ω 5%		502218	
R32	6800Ω 5%		502288	
R33	1000Ω		502210	
R34	56K		502356	
R35	68K		502368	
R36	18K		502318	
R37	8100Ω	5	104490	
R38	2200Ω		502222	
R39	330Ω		502133	
R40	47K	1	512347	
R41	56K		502356	
R42	220K		502422	
R43	22K		502322	
R44	270K		502427	
R45	10K	1	512310	
R46	1000Ω		502210	
R47	82Ω		502082	
R48	390K		502439	
R49	100K		503410	
R50	470K		502447	
R51	18K	2	522318	

ITEM No.	RATING OHMS	RATING WATT	RCA Victor PART No.	NOTES
R52	5600		502256	
R53	2200Ω	2	522222	
R54	680Ω	1	512168	
R55	33K		502333	
R56	680K		503468	
R57	18K		502318	
R58	1meg		502510	
R59	33K	2	522333	
R60	150K		502415	
R61	22K		502322	
R62	22K	1	512322	
R63	5600Ω		502256	
R64	6 6meg		502568	
R65	18K		502318	
R66	270K		502427	
R67	1.5meg		502515	
R68	8200Ω		502282	
R69	22K		502322	
R70	18K 5%		502318	
R71	3900Ω		502239	
R72	470K		502447	
R73	680K		502468	
R74	82K 5%	1	512322	
R75	1500		502215	
R76	1500		502215	
R77	1500Ω		502215	
R78	1.2meg		502512	
R79	56K	1	512356	
R80	560K		502456	
R81	82K 5%		502382	
R82	150K 5%		502415	
R83	18K		502239	
R84	100K 5%	1	512410	
R85	47K		502347	
R86	330K		502433	
R87	47Ω		502047	
R88	1meg		502510	
R89	6800Ω	2	522268	Note 4
R90	150	1	104488	
R91	68K		502368	
R92	4700Ω		502347	
R93	4.7Ω		104547	
R94	3300Ω		502233	
R95	6800Ω	7	104388	
R96	30Ω	10	104391	Note 5
R97	5 6Ω		100117	
R98	470K		503447	

Note 1. Some versions may use a 47K (Part #502347) in this application.
Note 2. Some versions may use a 56K (Part #502356) in this application.
Note 3. In some versions R59 and R60 may be a single 27K 2W (Part #522327).
Note 4. Some versions may use 8200Ω 2W (Part #522282) in this application.
Note 5. Chassis KCS-109C, D use 18Ω 10W (Part #140390) in this application.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	REPLACEMENT DATA RCA Victor PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	Vert Output	104085						A-115X	
T2A	Yoke-Horiz (30MH)	104483 ①				DY27A		Y-68-2	
B	(10°)Vert (12MH)								
M9	Rear Cover & Centering Device	104480							
	Yoke Clamp	104409							
T3	Horiz. Output	104481				RO-290 *	FLY-100 *		
T4	Width Coil (S-17MH)	103104	RF900 ②③	MWC-11	20LR18	WC-12 ③④	WC-18 ③	WLC-6	

① Includes resistors R76, R77 and capacitor C103.
② Use terminals #1 and #2.
③ Enlarge mounting hole.
④ Use black and white terminals.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

	ORIGINAL TERMINAL CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
	5				5	5	
	4				4	4	
	3				3	3	
	2				2	2	
	1				1	1	
Connect Width Coil Across	2 & 1				2 & 1	2 & 1	
Special Notes							

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA RCA Victor PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T5	7800Ω	3-4Ω	100037	Z1005	A-3020	A-3949	36S48	S-9Z	

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA RCA Victor PART No.	QUAM PART No.	NOTES
SP1	8"	PM	3-4Ω	104961	8AD8R	

COILS (RF-IF)

ITEM No.	USE	RCA Victor PART No.	NOTES
L1	Ant. Matching Trans. Assy.	104430	Includes traps
L2	Ant. Coils	104428	Channel 2-13, Includes C16 & Stator Assy.
L3	RF Coils	104426	Channel 2-13, Includes C8, C9A, & Stator Assy.
L4	Coupling Strap	104068	Includes C8, C9A, & Stator Assy.
L5	Coupling Strap	104068	
L6	Mixer Grid Coils	104425	Channel 2-13, Includes C22, R6, R7, R8 & Stator Assy. Channel 2-13, Includes R11, C25, C26, C27 & Stator Assy. 8.5 Microhenries
L7	Osc. Coils	104424	
L8	RF Choke	104680	
L9	UHF IF Trans.	102868	

ITEM No.	USE	RCA Victor PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L10	47.25MC Trap	104141					
L11	RF Choke						
L12	1st. Video IF Grid Coil	104140					
L13	1st. Video IF Plate Coil	104231					
L14	2nd. Video IF Grid Coil	104232					
L15	2nd. Video IF Plate	104233					
L16	RF Choke						
L17	Series Peaking Coil	101819	19-3036	TV-180	6176	VP-1	38 Microhenries
L18	Shunt Peaking Coil	104228	19-4400	TV-301	6184		390 Microhenries, Note 1
L19	Shunt Peaking Coil	104230	19-3300	TV-199	6185		300 Microhenries
L20	Series Peaking Coil	103466	19-3125	TV-196	6183	VP-4	120 Microhenries
L21	Shunt Peaking Coil	104230	19-3300	TV-199	6185		300 Microhenries
L22	1st. Sound IF	104126					Includes cap.
L23	2nd. Sound IF	104127					
L24	Quadrature Coil	104234					Includes cap. & resistor
L25	RF Choke						4.7 Microhenries, IRC Part #CL-1
L26	RF Choke						6.7 Microhenries, IRC Part #CL-1
L27	FU. Choke	73477	19-4125	BC-537	4809		5.4 Microhenries

Note 1. Chassis KCS-109C, D use part #104230 in this application.
Note 2. Not used in some versions.

TRANSFORMER (HORIZ. OSC.)

ITEM No.	DC RES. PRI	DC RES. SEC.	REPLACEMENT DATA RCA Victor PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Thordarson PART No.	NOTES
L28	65Ω *		103570		TV-185			28S-7	Horiz. Freq. 16-20 Milliohenries * Tapped @ 45Ω Horiz. Waveform
L29	44Ω		102195						

FILTER CHOKE

ITEM No.	RATINGS TOTAL DIRECT CURRENT	RATINGS D.C. RESISTANCE	RATINGS INDUCTANCE (0 CURRENT 1000 ~)	REPLACEMENT DATA RCA Victor PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
L30	280A	47Ω	1.1 Hy.	[illegible]	C-5037 ①	C-3991 ①	C-3536 ①	26C44 ①	C-24X

① Drill new mounting hole.

RCA VICTOR MODELS 17-D-8185, U, 17-D-8186, U, 17-D-8187, U, 17-PD-8093, U, 17-PD-8094, U, 17-PD-8099, U, 17-PT-8071, U, 17-PT-8072, U (Ch. KCS109A, B, C, D)

FOLDER 3

PARTS LIST AND DESCRIPTIONS (Continued)

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	RCA Victor PART No.	REPLACEMENT DATA
K1	Ant. Isolation (VHF)	470mmf, .3-1meg	104328	Centralab RC-471 Sprague R-9177
K2	Ant. Isolation (VHF)	470mmf, .3-1meg	104328	Centralab RC-471 Sprague R-9177
K3	Ant. Isolation (UHF)	470mmf, .3-1meg	104328	Centralab RC-471 Sprague R-9177
K4	Ant. Isolation (UHF)	470mmf, .3-1meg	104328	Centralab RC-471 Sprague R-9177
K5	Sound IF Grid	56mmf 10%, 47K	104329	Centralab RC-421
K6	Sync Coupling	330mmf, 330mmf, 2.2meg, 1meg, 270K	104330 ①	

① In Ch. KCS-109C, D part #104332 (consisting of 330mmf, 330mmf, 2.2meg, 560K, 270K) is used in this application.

RECTIFIERS

ITEM No.	RATING	REPLACEMENT DATA					NOTES
	CURRENT (Measured)	RCA Victor PART No.	FEDERAL PART No.	GENERAL ELECTRIC PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	
M1		104483 ①	1356A ①	1N1007 ②	MR350 ①	350A ① M500 ③	① Selenium type. ② Germanium type. ③ Silicon type.
M2		100035 ①	1090A ①	1N1007 ②	MR350 ①	350 ① M500 ③	

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			RCA Victor PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M3	C	3/10A 250V	102164	102162	332.300 (C 3/10A-250V)	346001	C 3/10	HC 3/10 to 1/2

CRYSTAL DIODES

ITEM No.	ORIG. TYPE	REPLACEMENT DATA			NOTES
		RCA Victor PART No.	CBS PART No.	SYLVANIA PART No.	
M4	1N82 *	104001	1N82	1N82	UHF Mixer (Clip-in) * A K3D may be used in some versions
M5		76675A	1N60	1N60	Video Det. (Pigtail)

MISCELLANEOUS

ITEM No.	PART NAME	RCA Victor PART No.	NOTES
M6	Tuner	104556	VHF (KRK45A) Ch. KCS109B
	Tuner	104557	VHF (KRK47B) Ch. KCS109D
	Tuner	104562	VHF (KRK46B) Ch. KCS109C
	Tuner	104051	VHF (KRK44A) Ch. KCS109A
M7	Tuner	104593	UHF (KRK64E) Ch. KCS109B, KCS109D
M8	Centering Device	104460	Includes rear cover
	Printed Board	104452	Less tubes (Ch. KCS109A, B)
	Printed Board	104453	Less tubes (Ch. KCS109C, D)

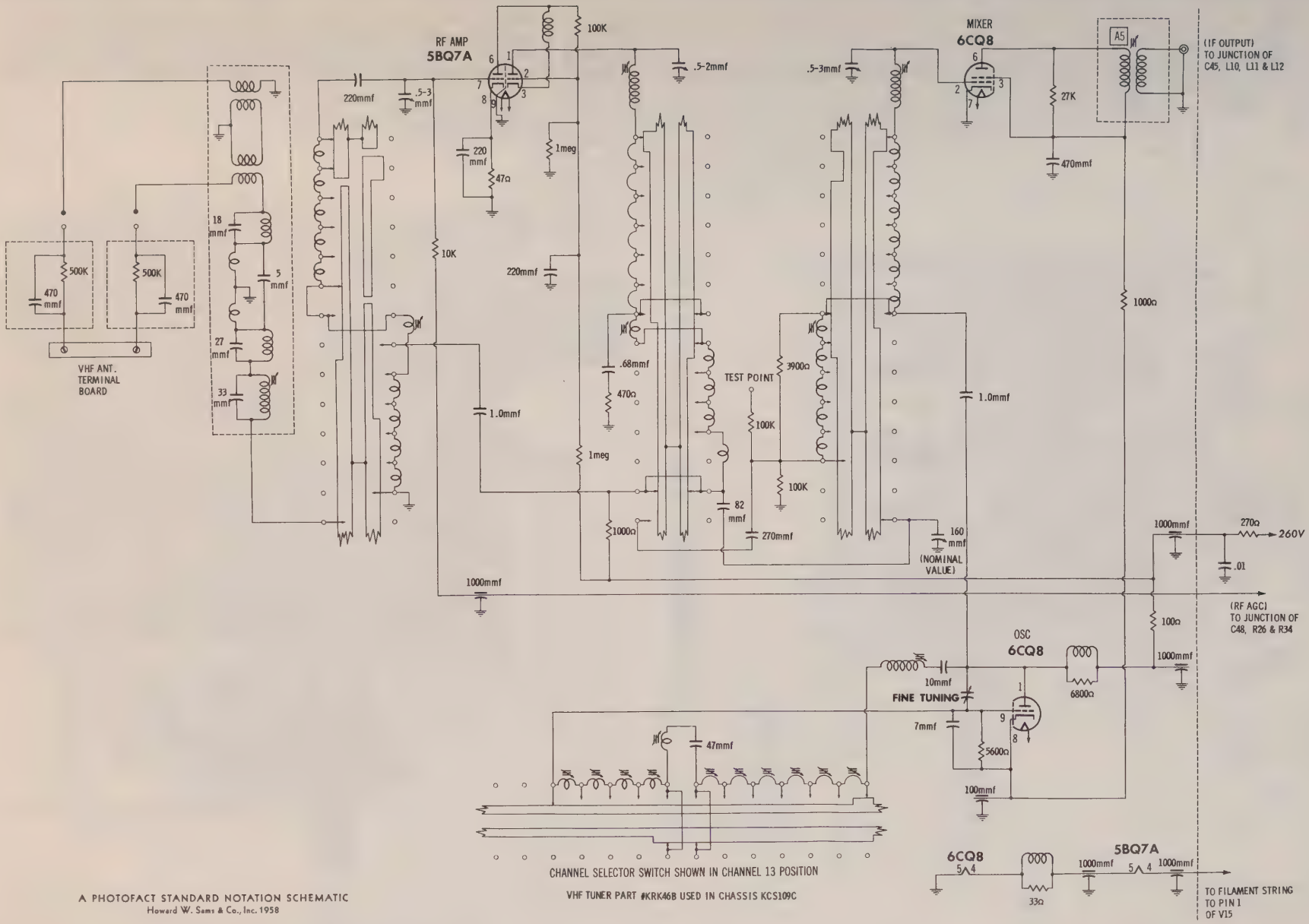
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Safety Glass	104456	
Bezel	104454	
Mask	104455	
Handle	104355	Models 17PD8093, U, 8096, U, 8099, U
Handle	104356	Models 17PD8094, U
Handle	104372	Models 17PT8071, U
Handle	104967	Models 17PT8072, U

WIRING DATA

High Voltage Lead	Use BELDEN No. 8869
Shielded Hook-up Wire	Use BELDEN No. 8885 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No. 8874
300Ω Tuner Input Lead	Use BELDEN No. 8225
300Ω Antenna Lead-in	Use BELDEN No. 8230 or 8275
Antenna Rotor Cable	Use BELDEN No. 8464 (Flat) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8488 (Round) - 8 Conductor



A PHOTOFACT STANDARD NOTATION SCHEMATIC
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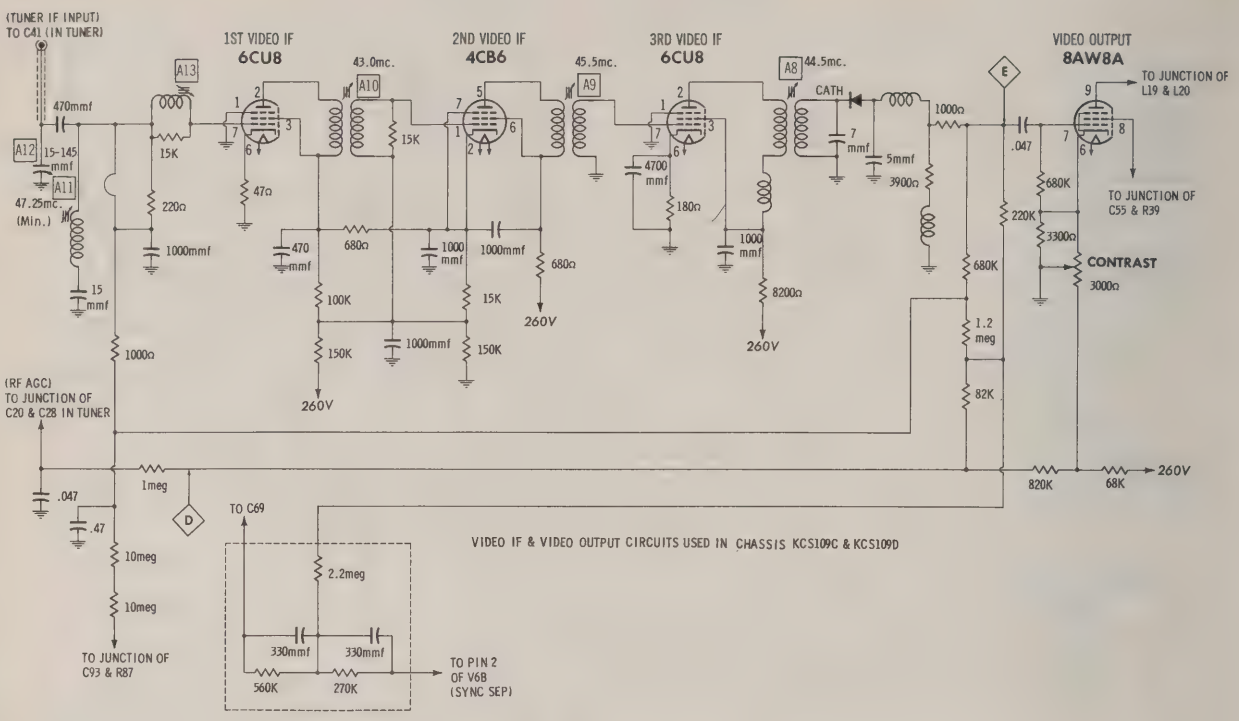
ALTERNATE VHF TUNER SCHEMATIC

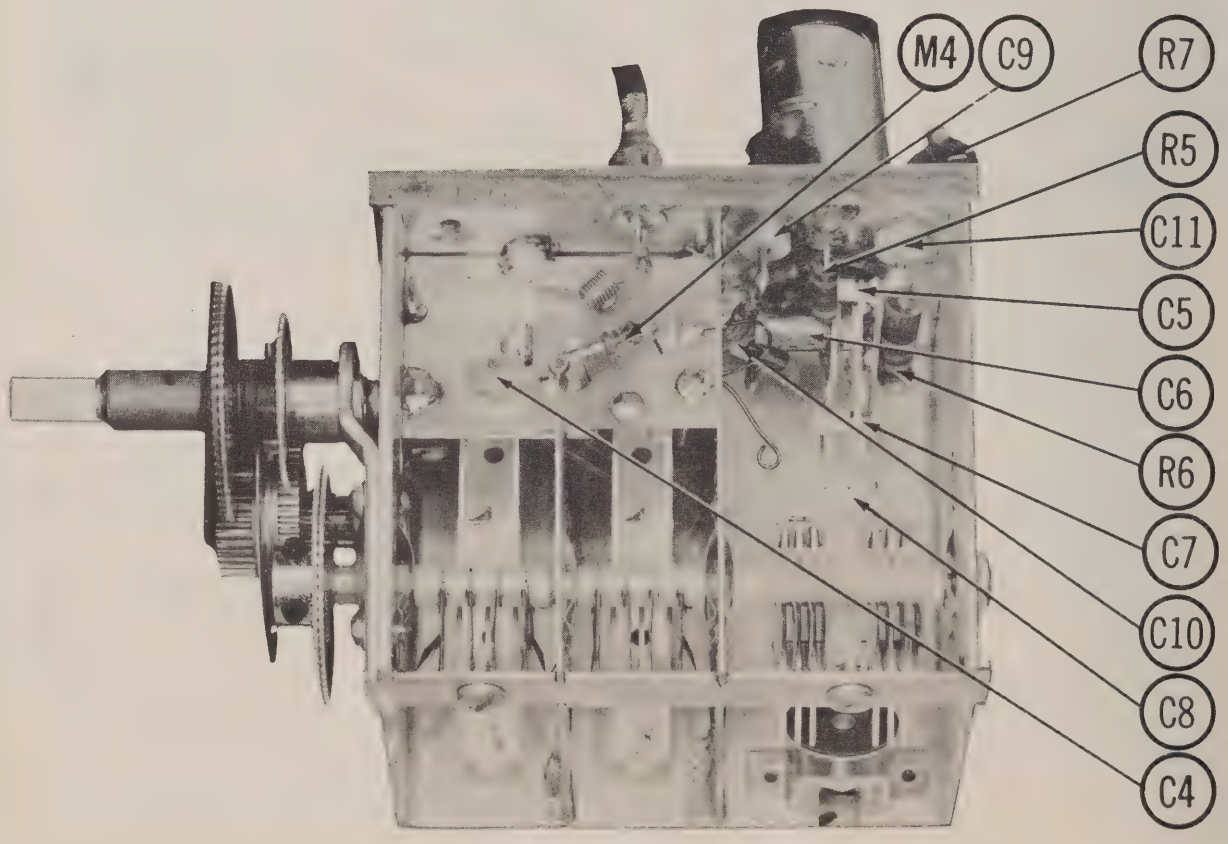
RCA VICTOR MODELS 17-D-8185, U, 17-D-8186, U, 17-D-8187, U,
17-PD-8093, U, 17-PD-8094, U, 17-PD-8099, U, 17-PT-8071, U,
17-PT-8072, U (Ch. KCS109A, B, C, D)



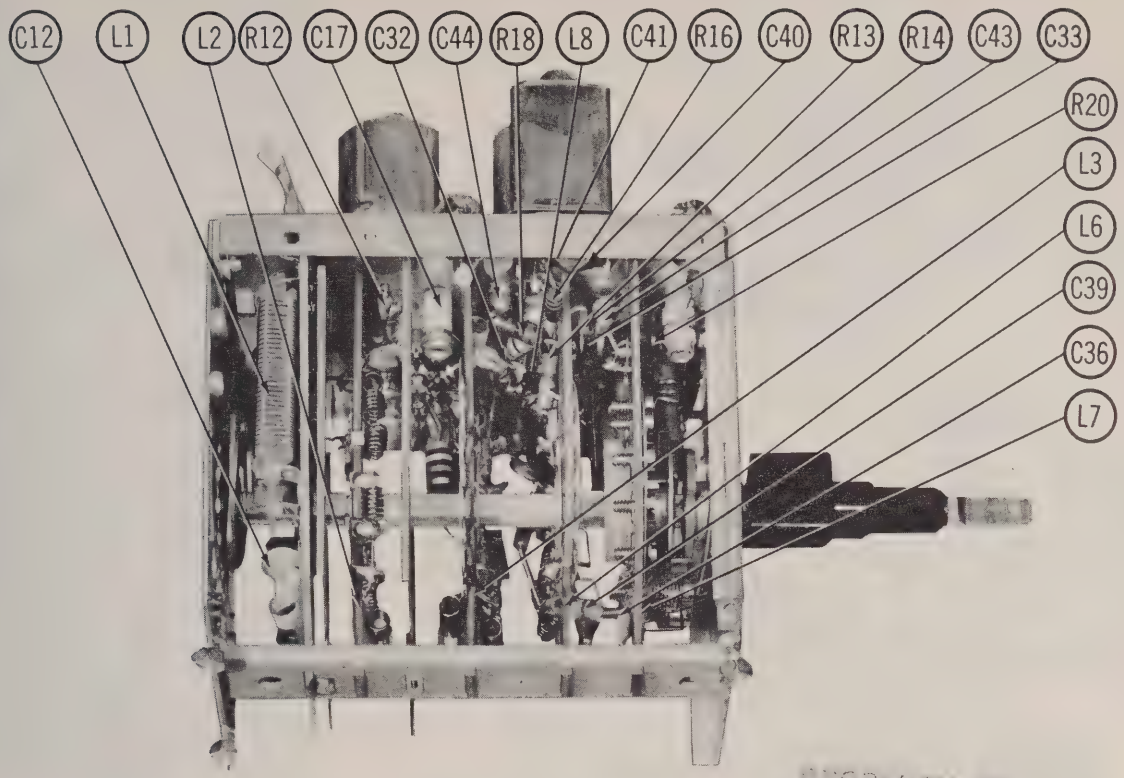
VIDEO IF & VIDEO OUTPUT CIRCUITS USED IN CHASSIS KCS109C & KCS109D

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

ALTERNATE VIDEO IF SCHEMATIC



UHF TUNER



RF TUNER-LEFT SIDE

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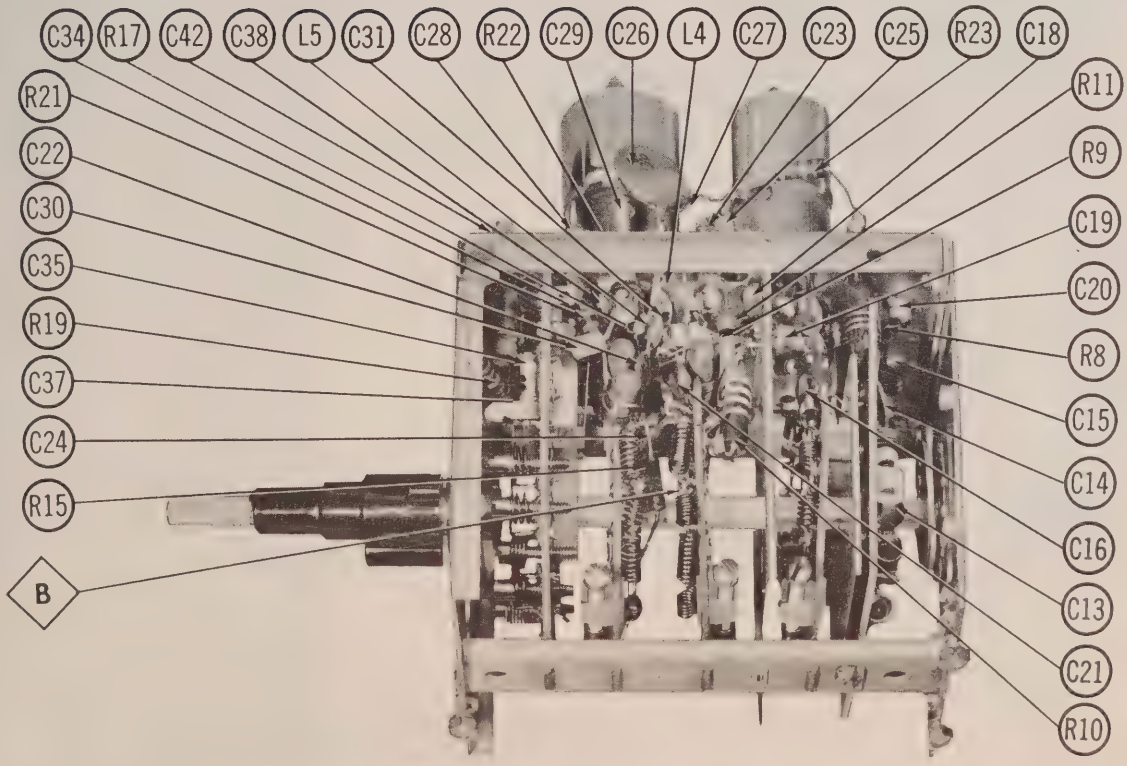
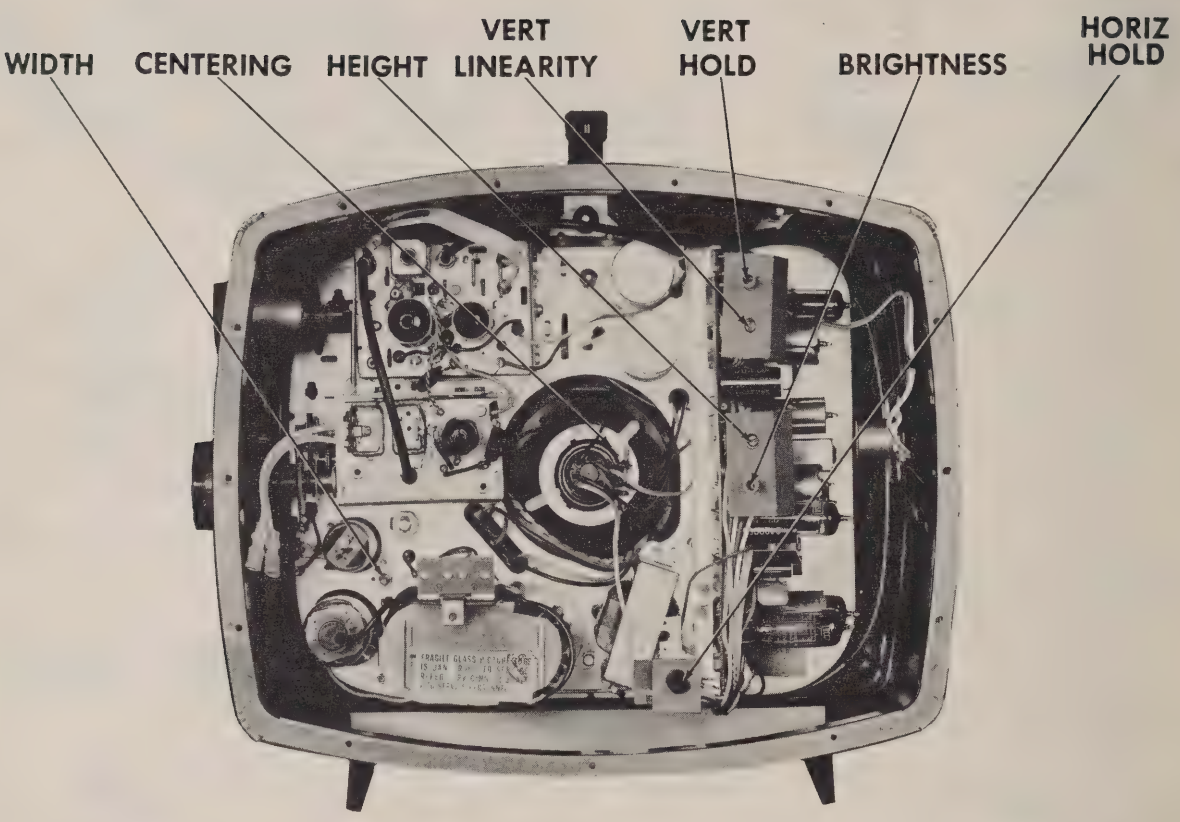
L.F. STANLEY SHIP
[illegible] MEADE ST.
DENVER, COLORADO



RF TUNER-RIGHT SIDE



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

Reduce the line voltage to 105 volts. Adjust the width slug (B1) until the picture fills the mask. Reset the line voltage to 117 volts. The picture should overscan the screen approximately 3/4" on each side. Turn the waveform slug (B2) fully clockwise. Adjust the horizontal hold counter clockwise and observe the number of diagonal lines present just before motorboating occurs. Adjust B2 until 3 diagonal lines are present just before motorboating. The picture should remain in sync for approximately 2/3 turn of the horizontal hold.

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3924 MEADE ST.
DENVER, COLORADO

PROPERTY
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

WESTINGHOUSE MODELS H-17T241 thru H-17TU245 (Ch. V-2373-1, V-2383-1)

DISASSEMBLY INSTRUCTIONS

CHASSIS REMOVAL

1. Remove 4 push-on type knobs from the side.
2. Remove 6 metal screws holding the rear cover. Remove the rear cover.
3. Remove the speaker leads and 2 hex nuts holding the speaker.
4. Remove 2 snap-in fasteners holding the antenna terminal board.
5. Remove the screw holding the telescoping antenna. Remove the antenna.
6. Remove the picture tube socket, yoke clamp and HV lead.
7. Remove 2 chassis bolts holding the vertical chassis to the top of the cabinet.
8. Remove 4 chassis bolts from the bottom.
9. Remove the chassis and yoke.

MODEL H-17T242 (CH. V-2373-1)

CAUTION NOTE

ONE SIDE OF AC LINE CONNECTED TO CHASSIS
Care should be exercised when connecting test equipment or physically contacting the chassis.

TRADE NAME	Westinghouse	MODELS	CHASSIS
		H-17T241, H-17T242, H-17T243, H-17T244, H-17T245	V-2373-1
		H-17TU241, H-17TU242, H-17TU243, H-17TU244, H-17TU245	V-2383-1
MANUFACTURER	Westinghouse Electric Corp., Television & Radio Div., Metuchen, N.J.		
TYPE SET	Television Receiver		
TUBES	Fifteen		
POWER SUPPLY	105-120 Volts AC, 60 Cycle	RATING 135 Watts, 1.2 Amp. @ 117 Volts AC	
TUNING RANGE	Channels 2 thru 13 VHF, 14 thru 83 UHF, Video IF 45.75MC, Sound IF 41.25MC (Intercarrier)		

SERVICING IN THE FIELD

TUNER OSCILLATOR ADJUSTMENTS

Touch-up adjustment of the VHF oscillator is possible by removing the rear cover and suppling power to the receiver. Set the fine tuning at the center of its range. The adjustments are accessible, one at a time, through a hole in the right side of the tuner rear cover as viewed from the rear. Adjust for best picture and sound.

PICTURE TUBE SAFETY GLASS CLEANING

For picture tube and safety glass cleaning, it is necessary to remove the chassis. (See disassembly instructions).

HORIZONTAL OSCILLATOR FIELD ADJUSTMENTS

For adjustment of the horizontal oscillator, it is necessary to remove the rear cover and supply power to set. Set the horizontal hold at the center of its range and adjust the horizontal frequency slug (B2) until the picture synchronizes horizontally. (For location, see tube placement chart).

SOUND IF DETECTOR BUZZ ADJUSTMENT

To eliminate audio detector buzz, adjust the quieting control for MINIMUM buzz and maximum sound. (For location, see tube placement chart).

FUSE DEVICE

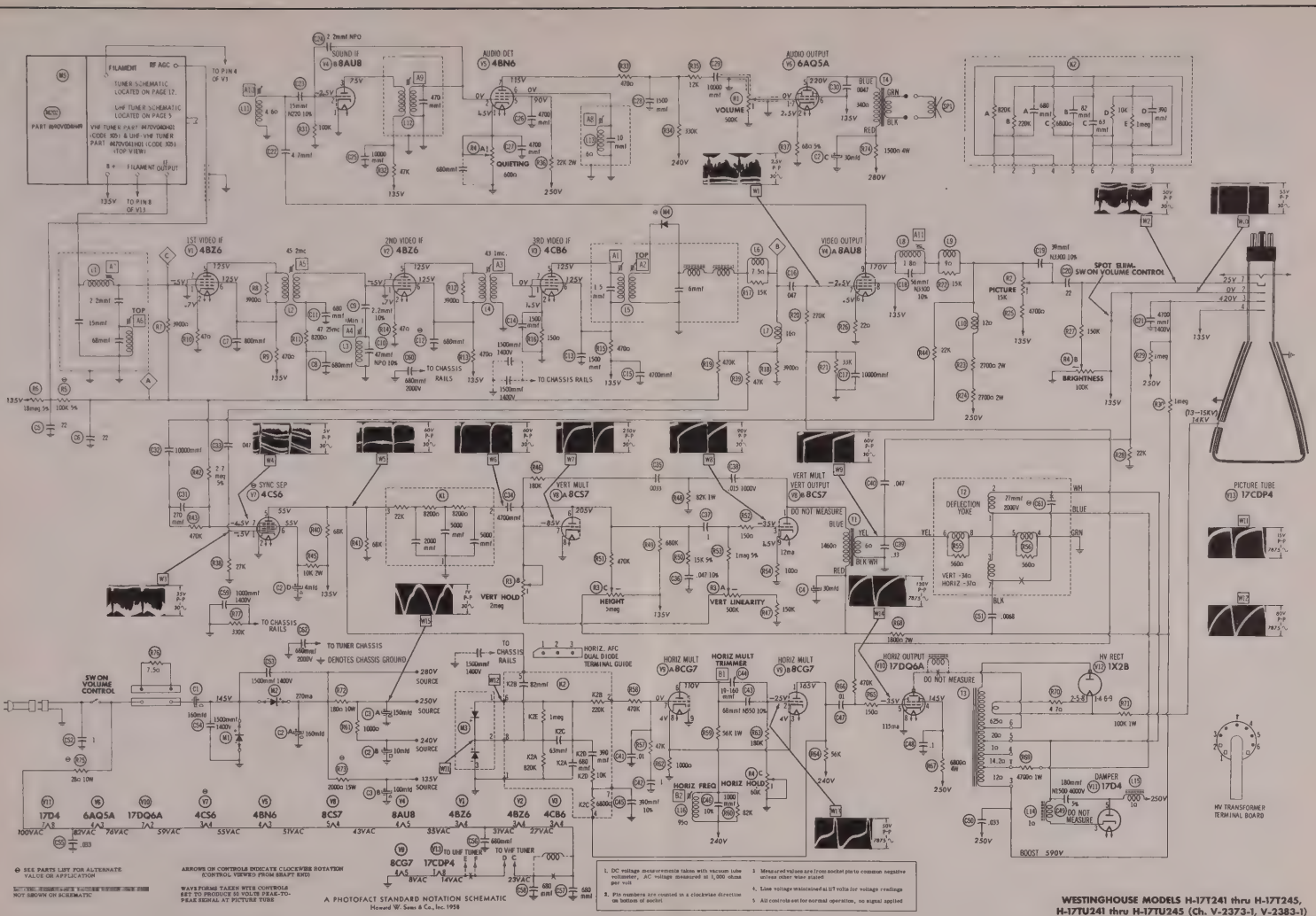
A 7.5Ω fusible resistor (R77) is used for LV power supply protection. (For location, see tube placement chart).

CENTERING

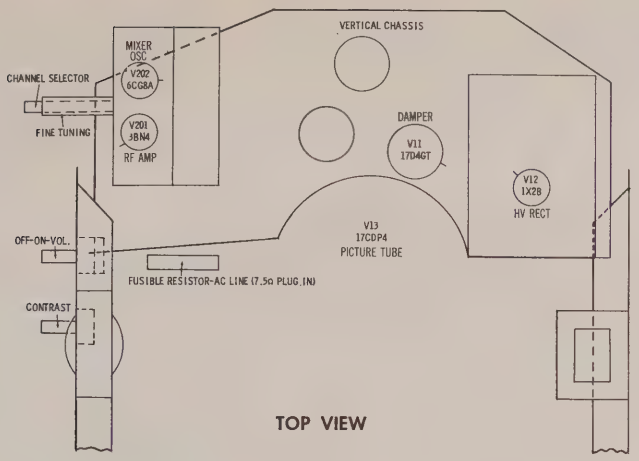
Centering is accomplished mechanically by adjusting two magnetic rings around the neck of the picture tube. Rotate the two rings around the neck of the tube until the picture is properly centered.

WESTINGHOUSE MODELS H-17T241 thru H-17T245, H-17TU241 thru H-17TU245 (Ch. V-2373-1, V-2383-1)

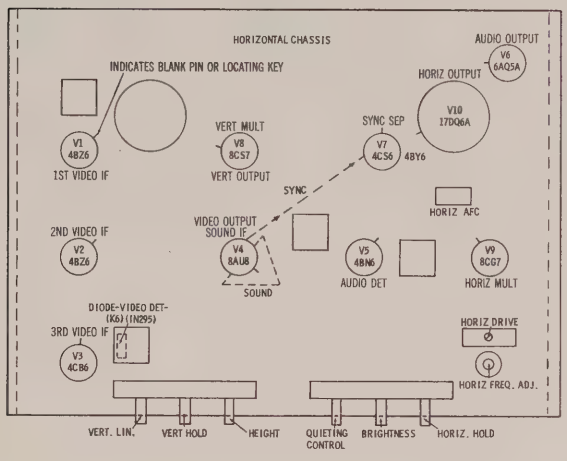
The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1958 Howard W. Sams & Co., Inc., Indianapolis 5, Indiana. Printed in U.S. of America


WESTINGHOUSE MODELS H-17T241 thru H-17T245,
H-17TU241 thru H-17TU245 (Ch. V-2373-1, V-2383-1)
A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958
SW ON VOLUME CONTROL
VOLUME 500K
QUIETING
VERT HOLD
HEIGHT
VERT LINEARITY
HORIZ FREQ
HORIZ HOLD
PICTURE 15K
BRIGHTNESS 100K
SPOT ELIM. SW ON VOLUME CONTROL
DO NOT MEASURE
BOOST 590V
TO CHASSIS RAILS
TO TUNER CHASSIS
DENOTES CHASSIS GROUND
TO VHF TUNER
HV TRANSFORMER TERMINAL BOARD
PICTURE TUBE V13 17CDP4
DEFLECTION YOKE
HORIZ. AFC DUAL DIODE TERMINAL GUIDE
1. DC voltage measurements taken with vacuum tube voltmeter, AC voltage measured at 1,000 ohms per volt
2. Pin numbers are counted in a clockwise direction on bottom of socket
3. Measured values are from socket pin to common negative unless other wise stated
4. Line voltage maintained at 117 volts for voltage readings
5. All controls set for normal operation, no signal applied
ARROWS ON CONTROLS INDICATE CLOCKWISE ROTATION (CONTROL VIEWED FROM SHAFT END)
WAVEFORMS TAKEN WITH CONTROLS SET TO PRODUCE 55 VOLTS PEAK-TO-PEAK SIGNAL AT PICTURE TUBE
SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
WESTINGHOUSE MODELS H-17T241 thru H-17T245,
H-17TU241 thru H-17TU245 (Ch. V-2373-1, V-2383-1)

TUBE PLACEMENT CHART



TOP VIEW



TUBE FAILURE CHECK CHART

The following chart lists tubes whose failures are most likely to produce the indicated symptoms. Refer to tube placement chart for location and type of tube.

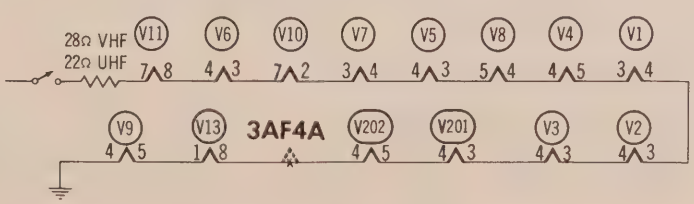
POWER SUPPLY FAILURE
No raster, no sound - **Fusible Resistor (R77), Rectifier (M1, M2)**

LOSS OF PICTURE OR SOUND
No pic, no sound, has raster - **V1, V2, V3, Diode (M4), V4**
No pic, no sound, has snow - **V201, V202, V1**
No pic, has sound, has raster - **V4, V13**
Has pic, no sound - **V4, V5, V6**

SYNC FAILURE
No vert. sync - **V7**
No horiz. sync - **V7, Rectifier (M3)**
No vert. or horiz. sync - **V7**

SWEEP FAILURE
No raster, has sound - **M3, V9, V10, V11, V12, V13**
No vertical deflection - **V8**
Poor vert. linearity or foldover - **V8**
Poor horiz. linearity or foldover - **V9, V10, V11**
Narrow picture - **V9, V10, V11, M1, M2**
Vert. off freq. - **V8**
Horiz. off freq. - **V9**

This receiver employs tubes used in a series filament network, an open filament in any tube in the series will cause the set to be inoperative (See circuit below).



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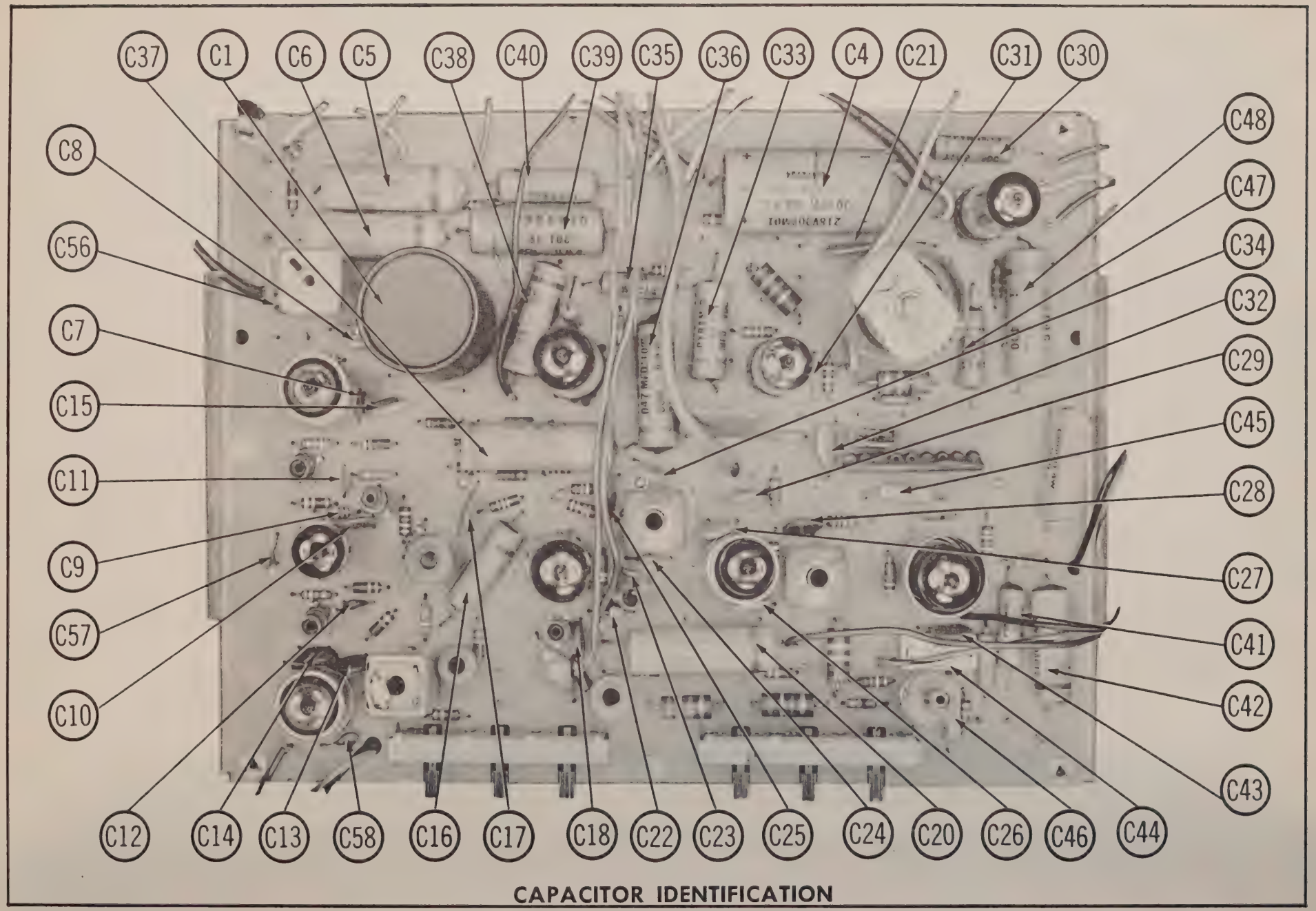
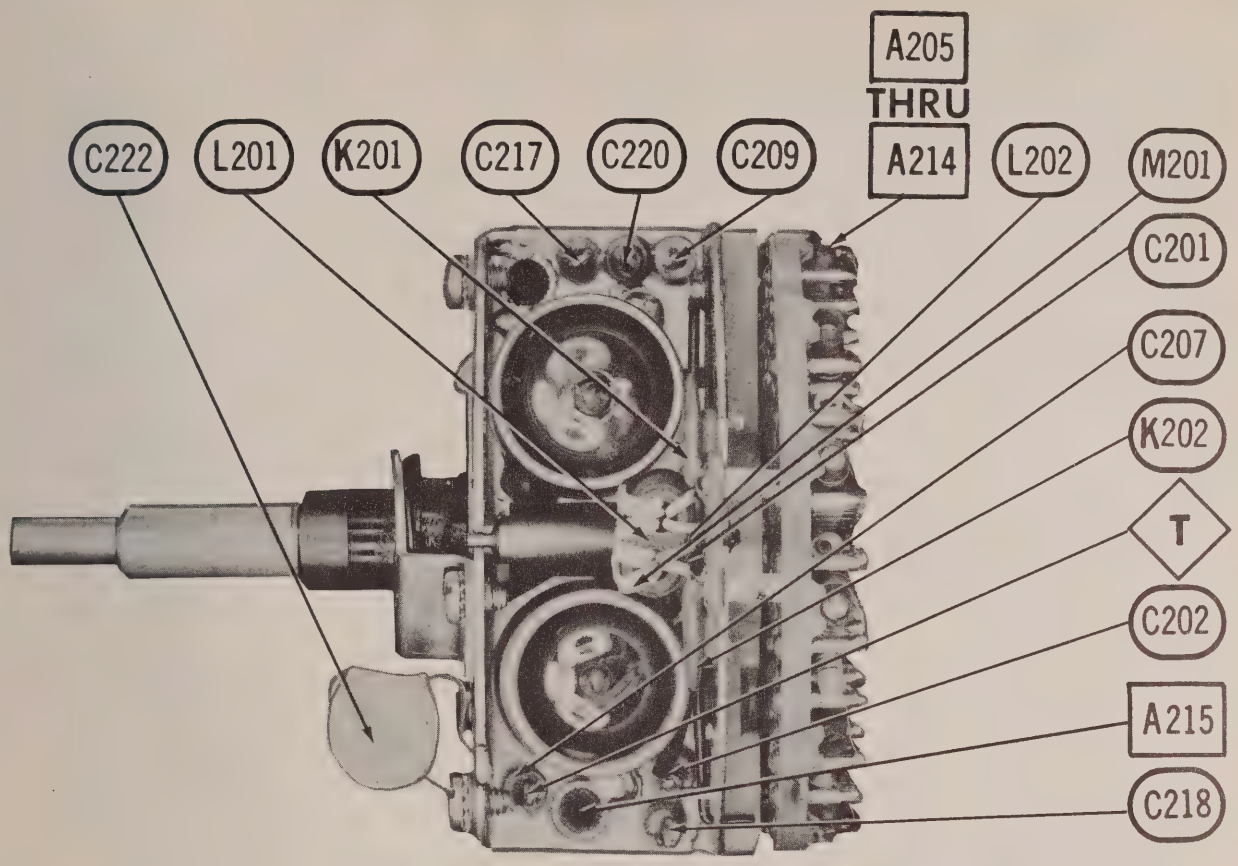


CAPACITOR IDENTIFICATION



RF TUNER-TOP VIEW

PROPERTY OF
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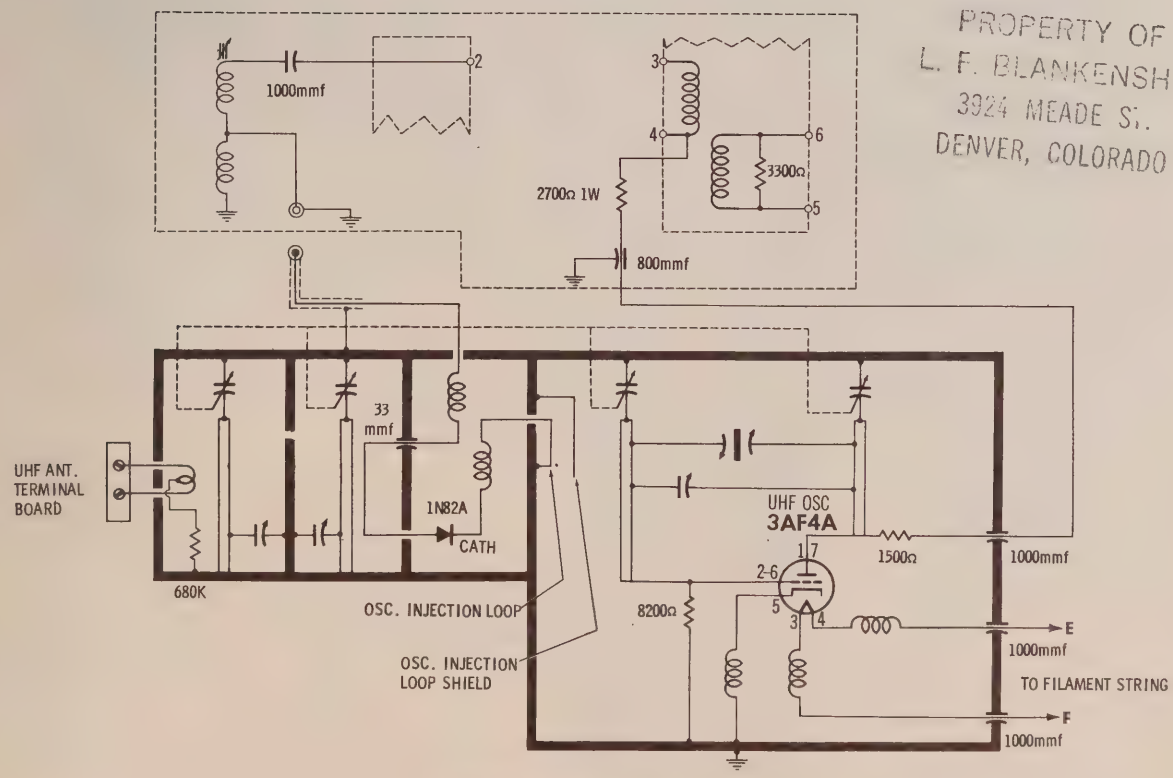


UHF TUNER PART #472V032H01

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

UHF TUNER SCHEMATIC

TUNER ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

USE AN ISOLATION TRANSFORMER TO PROTECT THE TEST EQUIPMENT.
The high voltage lead should be securely taped and kept away from the chassis.

VHF OSCILLATOR ALIGNMENT

Set the fine tuning to the center of its range. The adjustment slugs are accessible one at a time thru a hole in the right side of the tuner rear cover when viewed from the rear. As the channel selector is rotated, adjust for best picture and sound.

VHF RF AND MIXER ALIGNMENT

Connect the negative lead of a 2.5 volt bias supply to point Ⓣ . Positive to chassis.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
Use only enough sweep generator output to provide a usable pattern on scope.
Use 10MC sweep unless otherwise noted.

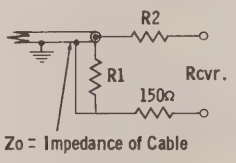
	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	Fig. 201	Across antenna terminals matching network (Fig. 201).	207MC	205.25MC 209.75MC	12	Vert. Amp. thru 10K to point Ⓤ. Low side to chassis.	A201, A202	Adjust A201 and A202 for maximum amplitude and symmetry with markers as shown in Fig. 202.
2.	"	"	213MC	211.25MC 215.75MC	13	"	A203	Adjust for maximum amplitude of response similar to Fig. 202. Adjust by expanding or compressing coil turns. Coils A203 thru A214 are accessible thru the rectangular hole on left side of tuner rear cover when viewed from rear.
			207MC	205.25MC 209.75MC	12		A204	
			201MC	199.25MC 203.75MC	11		A205	
			195MC	193.25MC 197.75MC	10		A206	
			189MC	187.25MC 191.75MC	9		A207	
			183MC	181.25MC 185.75MC	8		A208	
			177MC	175.25MC 179.75MC	7		A209	
			85MC	83.25MC 87.75MC	6		A210	
			79MC	77.25MC 81.75MC	5		A211	
			69MC	67.25MC 71.75MC	4		A212	
			63MC	61.25MC 65.75MC	3		A213	
			57MC	55.25MC 59.75MC	2		A214	

44MC TRAP

An antenna trap adjusted by A215 is normally set at the factory at 44MC. However, A215 may be adjusted to attenuate any interference between 40 and 46MC.

UHF ALIGNMENT

This portion of the receiver has been properly aligned at the factory and is very stable. Alignment of this portion should not be required in the field.



Zo	R1	R2
50Ω	56Ω	120Ω
75Ω	82Ω	110Ω

FIG. 201

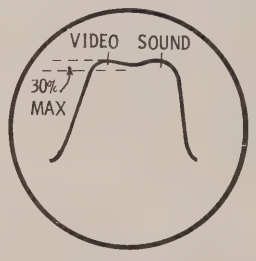
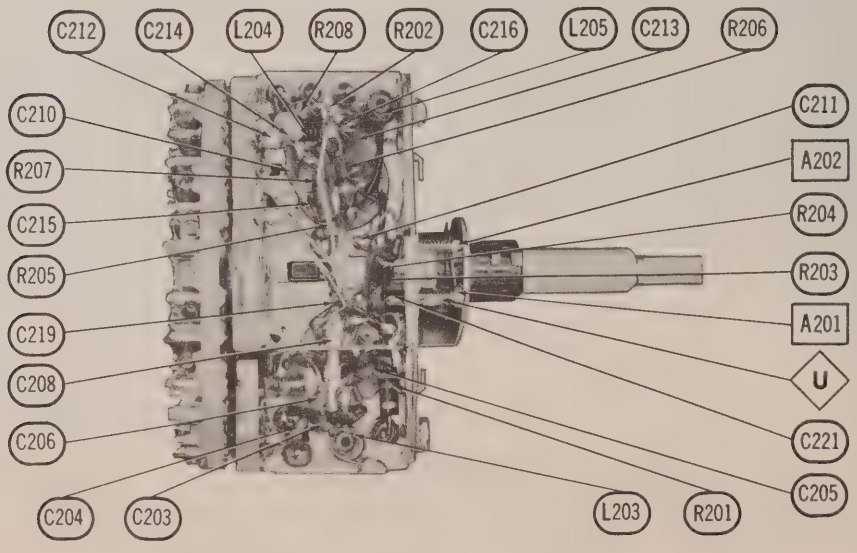


FIG. 202



RF TUNER–BOTTOM VIEW

ALIGNMENT INSTRUCTIONS

PRE-ALIGNMENT INSTRUCTIONS

USE AN ISOLATION TRANSFORMER TO PROTECT THE TEST EQUIPMENT.
The high voltage lead should be securely taped and kept away from the chassis.
Allow a 20 minute warm-up period for the receiver and test equipment.

VIDEO IF ALIGNMENT

Connect the negative lead of a 3 volt bias supply to point Ⓐ . Positive to chassis.
Preset A7 fully counter clockwise.
Connect the synchronized sweep voltage from the sweep generator to the horizontal input of the oscilloscope for horizontal deflection.
Connect a 470mmf capacitor across the input leads of the scope and the VTVM.
Use only enough generator output to provide a usable indication on VTVM.
Use only enough sweep generator output to provide a usable pattern on scope.

	DUMMY ANTENNA	SWEEP GENERATOR COUPLING	SWEEP GENERATOR FREQUENCY	MARKER GENERATOR FREQUENCY	CHANNEL	CONNECT SCOPE	ADJUST	REMARKS
1.	.001mfd	High side to pin 1 (grid) of 4CB6 (V3). Low side to chassis.	44MC (10MC Swp)	43.9MC	Any non-interfering channel	Vert. Amp. thru 47K to point Ⓑ . Low side to chassis.	A1, A2	Adjust A1 for maximum amplitude of response. Adjust A2 to correct tilt.
2.	"	High side to point Ⓒ . Low side to chassis.	Not used	43.1MC	"	USE VTVM. DC probe thru 47K to point Ⓑ . Common to chassis.	A3	Adjust for maximum deflection.
3.	"	"	"	47.25MC	"	"	A4	Adjust for MINIMUM deflection.
4.	"	"	"	45.2MC	"	"	A5	Adjust for maximum deflection.
5.	"	"	44.0MC (10MC Swp)	41.25MC 42.25MC 43.0MC 44.0MC 45.0MC 45.75MC 47.25MC	"	Vert. Amp. thru 47K to point Ⓑ . Low side to chassis.		Retouch A1, A2, A3 and A5 if necessary for response similar to Fig. 1. NOTE: If excessive tilt is present adjust A1 and A2 to 44.5MC.
6.	"	High side to tuner test point. Low side to chassis.	Not used	41.25MC	"	USE VTVM. DC probe thru 47K to point Ⓑ . Common to chassis.	A6	Adjust for MINIMUM deflection.
7.	Fig. 201	Across antenna terminals thru matching network (See Fig. 201 in tuner alignment).	"	59.75MC	2	"	Fine tuning	Adjust for MINIMUM deflection.
8.	"	"	57MC (10MC Swp)	55.25MC 59.75MC	"	Vert. Amp. thru 47K to point Ⓑ . Low side to chassis.	A7, Mixer Plate Coil	Adjust for maximum gain and symmetry of response similar to Fig. 2 with markers as shown. Adjust A7 for maximum gain, Mixer Plate Coil for proper tilt.

SOUND IF ALIGNMENT

1. Connect a high impedance AC voltmeter or scope across the volume control to serve as an indicator.
2. Set quieting control (R4A) to the center of its range.
3. Apply a 4.5MC FM signal (15KC sweep) to point Ⓑ . Connect low side to chassis.
4. Using a strong signal, adjust A8 for maximum deflection.
5. Reduce the signal strength to the lowest point that will provide an indication. Adjust A9 and A10 for maximum deflection.
6. Replace the FM signal with a 4.5MC AM signal (30% Mod.) and adjust the generator for a strong output.
7. Adjust the quieting control (R4A) for MINIMUM response or output.

ALTERNATE SOUND IF ALIGNMENT USING AIR SIGNAL

1. Tune the receiver to a TV station and connect an adjustable attenuator between the antenna terminals and lead-in so that the signal strength may be varied from strong to weak.
2. Set the quieting control (R4A) at the center of its range.
3. Apply a strong signal to the receiver and adjust A8 for maximum sound. If peaks occur at two widely separated positions, use the one which occurs with the slug farthest counter clockwise. If two peaks occur within a narrow range of adjustment, sufficient signal is not being applied and will have to be increased, or the quieting control is not set at the correct position.
4. Reduce the signal until a hiss is heard in the sound. Adjust A9 and A10 for maximum sound. If more than one peak occurs, use the one with the slug most counter clockwise.

4.5MC TRAP ALIGNMENT

Tune in a TV station and adjust all controls for a normal picture. Turn fine tuning to obtain a grainy effect (4.5MC beat pattern) in the picture. Adjust A11 for MINIMUM grain in the picture.

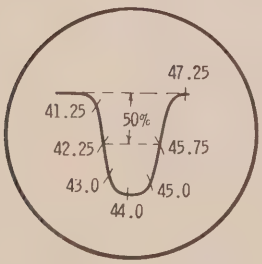


FIG. 1

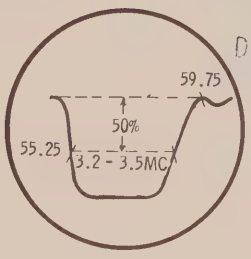


FIG. 2

L. R. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No	USE	TYPE	NOTES
V1	1st Video IF Amp	4BZ6	
V2	2nd Video IF Amp	4BZ6	
V3	3rd Video IF Amp	4CH6	
V4	Video Output-Sound IF Amp	6AU8	
V5	Audio Det	4BN6	
V6	Audio Output	6AQ8A	
V7	Sync Sep	4CS6	4BY6 *
V8	Vert Mult -Vert Output	8CS7	
V9	Horiz Mult	8CG7	
V10	Horiz Output	17DQ8A	
V11	Damper	17D4GT	
V12	HV Rectifier	1X2B	

* Alternate

PICTURE TUBE

ITEM No	REPLACEMENT DATA				NOTES
	Westinghouse PART No.	GENERAL ELECTRIC PART No.	RCA PART No.	SYLVANIA PART No.	
V13	17CDP4	17CDP4 ①			① Silvermma

ELECTROLYTIC CAPACITORS

ITEM No	RATING CAP	RATING VOLT	REPLACEMENT DATA Westinghouse PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.	NOTES
C1	180	300	218V035H03	AFH1-35-75						R2583 *
C2A	180	350	218V025H01	AFB4-66-95	XD0695	FP49 65				R2579 *
B	80	300				TC79				
C	30	300								
D	4	300								
C3A	250	300	218V035H02	AFH3-26	C0734 3	FP237 7	EWT-165	D-148		R2578 *
B	100	300				TC79	TD-40-3509	MT-4550		
C4	30	450	218V009H01	PRS450Y30	BR3045	TC77	TD-30-450	MT-4530	TVA-1711	

* Non-Catalog Item

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No	RATING CAP	RATING VOLT	REPLACEMENT DATA Westinghouse PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C5	.33	200	210V043A34	P288N-33		CUB2P33		GEM-4033	2TM-P33	
C6	.33	200	210V043A34	P288N-33		CUB2P33		GEM-4033	2TM-P33	
C7	680		215V100E18	BPD-0068	DD-681		ED-0068		5TCC-S47	
C8	680		215V16A81	BPD-00068	DD-681	BYA0D768	ED-680	UC-5368	5GA-T68	
C9	3.3		217V312A39	MPO-81 3.3	TCZ-3R3	C30V3RC	TCO-3.3		5TCCD-V33	10%
C10	47		215V100E47	BPD-047	TCZ-47	C30V47C	TCO-47		5TCC-Q47	NPO 10%
C11	680		215V16A81	BPD-00068	DD-681	BYA0D768	ED-680	UC-5368	5GA-T68	
C12	680		215V16A81	BPD-00068	DD-681	BYA0D768	ED-680	UC-5368	5GA-T68	
C13	1500		215V100E38	BPD-0015	DD-152	BYA0D15	ED-1500	DC5B15	5SK-D15	
C14	1500		215V100E38	BPD-0015	DD-152	BYA0D15	ED-1500	DC5B15	5SK-D15	
C15	4700		215V16A72	BPD-0047	DD-472	BYA0D747	ED-4700	UC-5347	5GA-D47	
C16	.047	200	217V004A72	P288N-047	DF-503	CUB2P47		GEM-4047	2TM-S47	
C17	10000		215V16A03	BPD-01	DD-103	BYA6S1	ED-01	DC5S1	5SK-S1	
C18	56		215V015A80							N330 10%
C19	39		215V013A80							N330 10%
C20	.33	400	217V043A34	P288N-33		CUB4P33		GEM-4033	4TM-P33	
C21	4700	1400	215V300E81	DAC-8	DD30-472	HVC182D47			20SK-D8	
C22	4.7		217V314J79	MPO-81 4.7	TCZ-4R7	C30V47C	TCO-4.7	ET-5547	5TCCD-V47	
C23	18		215V015A50							N220 10%
C24	2.2		215V300H09	MPO-81 2.2	TCZ-2R2	C30V2RC	TCO-2.2		5TCCD-V22	NPO
C25	10000		215V16A03	BPD-01	DD-103	BYA6S1	ED-01	DC5S1	5SK-S1	
C26	4700		215V104A72	BPD-0047	DD-472	BYA0D47	ED-0047	UC-5347	5GA-D47	
C27	4700		215V104A72	BPD-0047	DD-472	BYA0D47	ED-0047	UC-5347	5GA-D47	
C28	1500		215V100E38	BPD-0015	DD-152	BYA0D15	ED-1500	DC5B15	5SK-D15	
C29	10000		215V16A03	BPD-01	DD-103	BYA6S1	ED-01	DC5S1	5SK-S1	
C30	.0047	600	217V004A73	P288N-0047	DE-473	CUB4P47	GP-4700	GEM-4047	4TM-D47	
C31	270		215V300H38	BPD-00027	DD-271	L10T27	ED-270	UC-5347	5GA-T27	
C32	10000		215V16A03	BPD-01	DD-103	BYA6S1	ED-01	DC5S1	5SK-S1	
C33	.047	200	217V004A73	P288N-047	DF-503	CUB2P47		GEM-4047	2TM-S47	
C34	4700		215V104A72	BPD-0047	DD-472	BYA0D47	ED-0047	UC-5347	5GA-D47	
C35	.0033	600	217V103H01	P288N-0033	DE-333	CUB4P33	GP-3300	GEM-4033	4TM-D33	
C36	.047	600	217V103H03							10%
C37	.1	600	217V061A04	P288N-1	DF-104	CUB4P1		GEM-601	4TM-P1	
C38	.005	1000	217V213A33	P288N-005	DE-503	CUB1H5	ED-015	GEM-1015	1TM-S15	
C39	.33	200	217V003A34	P288N-33		CUB2P33		GEM-3033	2TM-P33	
C40	.047	300	217V004A73	P288N-047	DF-503	CUB3P47		GEM-4047	3TM-S47	
C41	.01	600	217V061A03	P488N-01	DE-103	CUB4S1	GP-10000	GEM-431	4TM-S1	
C42	.1	200	217V061A04	P288N-1	DF-104	CUB2P1		GEM-301	2TM-P1	
C43	68		215V015A80							N550 10%
C44	10-180		217V501H01							
C45	330		213Y013A8		D6-331	SSS739	ED-390		M5-339	10%
C46	680		213Y057A02	1464-001		1SS72	ED-1000	MCB355	M5-31	10%
C47	.01	600	217V051A03	P488N-01	DE-103	CUB4S1	GP-10000	GEM-431	4TM-S1	
C48	.1	600	217V061A04	P488N-1	DF-104	CUB4P1		GEM-601	4TM-P1	
C49	120	4000	215V300H09							N500 5%
C50	.033	600	217V213A33	P588N-033	DF-333	CUB6S33		GEM-6133	6TM-S33	
C51	.0068	600	217V216A33	P588N-0068	DE-683	CUB6D68	GP-6800	GEM-6286	6TM-D68	
C52	.1	600	217V21A04	P588N-1	DF-104	CUB6P1		GEM-601	6TM-P1	
C53	1500	1400	215V301A52	HVD-30-1500	DD30-152	HVC182D15	HD45-1500	DC3D215		
C54	1500	1400	215V301A52	HVD-30-1500	DD30-152	HVC182D15	HD45-1500	DC3D215		
C55	.033	600	217V213A33	P588N-033	DF-333	CUB6S33		GEM-6133	6TM-S33	
C56	680		215V16A81	BPD-00068	DD-681	BYA0D768	ED-680	UC-5368	5GA-T68	
C57	680		215V16A81	BPD-00068	DD-681	BYA0D768	ED-680	UC-5368	5GA-T68	
C58	680		215V16A81	BPD-00068	DD-681	BYA0D768	ED-680	UC-5368	5GA-T68	
C59	1000	1400	215V300H02	DAC-1		HVC182D	HD45-1000	DC3D21	20GA-D1	
C60	680	3000	215V300H19	HVD-30-680	DD30-681	HVB20T68	HD3-680	DC3D368		②
C61	27	3000								
C62	680	3000	215V300H19	HVD-30-680	DD30-681	HVB20T68	HD3-680	DC3D368		②

① Some versions may use 470mmf (Part #215Y300H07) in this application.
② Not used in some versions

CONTROLS

ITEM No	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA Westinghouse PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K	1	270V037H03	B-80	A47-500K-Z		U48	Volume
B	Shaft			Not Req.	FS-3		Not Req.	
C	Switch			K2-1	SWE-21		U8-38	AC & Spot Eliminator
R2A	15K	1	270V003H06	B-32	A47-15K-8	BU-118	TA153L	Picture
B	Shaft			Not Req.	FS-3	SK3	Not Req.	
R3A	500K	1	270V040H02					Vert. Lin.
B	2meg							Vert Hold
C	5meg							Height
R4A	600Ω	1	270V040H01					Quieting
B	100K							Brightness
C	50K							Horiz. Hold

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No	RATING OHMS	RATING WATT	Westinghouse PART No.	NOTES
R5	100K 5%		250V211A04	Note 1
R6	18meg 5%		250V211A56	
R7	3900Ω		259V003H02	
R8	3900Ω		259V003H02	
R9	470Ω		250V234A78	
R10	47Ω		250V234A70	
R11	8200Ω		259V003H08	
R12	3900Ω		259V003H02	
R13	47Ω		250V234A70	
R14	47Ω		250V234A70	
R15	470Ω		250V234A78	
R16	150Ω		250V221A51	
R17	15K		250V321A53	
R18	3900Ω		259V003H02	
R19	470K		250V221A04	
R20	470K		250V232A74	
R21	15K		250V223A53	
R22	15K		250V223A53	
R23	470Ω	2	250V432A78	
R24	2700Ω	2	250V432A72	
R25	470Ω		250V234A78	
R26	22Ω		250V222A20	
R27	150K		250V21A54	
R28	22K		250V223A33	
R29	1meg		250V321A05	
R30	1meg		250V321A09	
R31	56K		250V321A04	
R32	47K		250V234A73	
R33	470Ω		250V234A78	
R34	330K		250V233A34	
R35	12K		250V221A33	
R36	22K	2	250V432A23	
R37	56K		250V216A80	
R38	27K		250V222A73	
R39	47K		250V224A73	
R40	68K		250V228A83	
R41	68K		250V226A83	

ITEM No	RATING OHMS	RATING WATT	Westinghouse PART No.	NOTES
R42	2 7meg 5%		250V213A75	
R43	470K		250V234A74	
R44	22K		250V223A33	
R45	10K	2	250V421A03	
R46	180K		250V232A84	
R47	150K		250V232A54	
R48	82K	1	250V228A23	
R49	680K		250V228A84	
R50	15K 5%		250V21A53	
R51	470K		250V234A74	
R52	150Ω		250V231A51	
R53	1meg 5%		250V232A05	
R54	100K		250V232A08	
R55	560Ω		250V225A81	
R56	560Ω		250V225A81	
R57	47K		250V224A73	
R58	470K		250V224A74	
R59	56K	1	250V233A83	
R60	82K		250V228A23	
R61	1000Ω	1	250V212A02	
R62	1000Ω		250V232A02	
R63	180K		250V232A84	
R64	56K		250V233A83	
R65	150Ω		250V231A51	
R66	470K		250V224A74	
R67	680Ω	4	251V020H01	
R68	1800Ω	3	250V421A82	
R69	47000	1	250V232A72	
R70	4 7Ω		251V004A79	
R71	100K	1	259V003H09	
R72	18000	10	251V010H08	
R73	2000Ω	15	251V017H02	Note 2
R74	1500Ω	4	251V020H12	
R75	180	10	251V018H09	Note 3
R76	7.5Ω		259V002H01	
R77	330K		250V233A34	

Note 1. Some versions use a 470K 5% (Part #250V214A74) in this application.
Note 2. UHF versions use a 1800Ω 15W (Part #251V017H09) in this application.
Note 3. UHF versions use a 22Ω 10W (Part #251V018H0) in this application.

TRANSFORMERS (SWEEP CIRCUITS)

ITEM No	USE	REPLACEMENT DATA Westinghouse PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	Vert. Output	430V005H04	21900 ①		V312 ②		26854 ③	A-103X	
T2A	Yoke-Horiz (19MB)	490V006H01		MDF-111					
B	Q(@7)-Vert. (23MB)								
M6	Rear Cover & Centering Device	78V101H01							
	Yoke Clamp	78V914H03							
T3	Horiz. Output	493V004H07							D-95*

① Use 18 to 1 turns ratio.
② Remove green lead of yoke from ground. Connect green lead of yoke and green lead of vert. output transformer to junction of R68 and C4. Connect red lead to yellow lead of yoke.

*HORIZONTAL OUTPUT TRANSFORMER CONNECTION DATA

Use Original Width Coil Unless Replacement Type Is Listed

ORIGINAL FLYBACK CONNECTIONS	Halldorson Replacement Connections	Merit Replacement Connections	Ram Replacement Connections	Stancor Replacement Connections	Thordarson Replacement Connections	Triad Replacement Connections
6					6	
5					4	
T					T	
3					3	

TRANSFORMER (AUDIO OUTPUT)

ITEM No	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA Westinghouse PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T4	7000Ω	3-4Ω	430V041H01	ZU13	A-2931	AU-602	A-3878	24853	S-7X	

SPEAKER

ITEM No	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP	REPLACEMENT DATA Westinghouse PART No.	QUAM PART No	NOTES
SP1	4"	PM	3-4Ω	570V015H01	4A07	

COILS (RF-IF)

ITEM No	USE	REPLACEMENT DATA Westinghouse PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	1st. Video IF	235V003H01					Includes 41.25MC Trap
L2	2nd. Video IF	235V020H01					
L3	47.25MC Trap	230V030H01					
L4	3rd. Video IF	235V020H01					
L5	4th. Video IF	235V006H02					Includes Assembly
L6	Series Peaking Coil	230V034H03	19-3135	TV-196	6130		140 Microhenries
L7	Shunt Peaking Coil	230V034H04	19-3500	TV-198	6174	VP-8	800 Microhenries
L8	4.5MC Trap	230V030H03					
L9	Series Peaking Coil	230V019H13	19-3350	TV-195	6151	VP-6	250 Microhenries
L10	Shunt Peaking Coil	230V034H01		TV-190	6133	VP-7	
L11	1st. Sound IF	230V030H06					
L12	2nd. Sound IF	235V020H02					
L13	Quadrature Coil	230V031H01					
L14	RF Choke	230V019H10	19-1006		4634		14 Microhenries
L15	RF Choke	230V019H10	19-1006		4634		14 Microhenries

TRANSFORMER (HORIZ. OSC.)

ITEM No	DC RES PRI	DC RES SEC	REPLACEMENT DATA Westinghouse PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	Thordarson PART No	NOTES
L16	95Ω		230V032H01						

COMPONENT COMBINATIONS

ITEM No	USE	DESCRIPTION	Westinghouse PART No.	REPLACEMENT DATA	
E1	Vert. Integrator	2000mmf, 5000mmf, 5000mmf, 22K, 8200Ω, 8200Ω	219V008H01	Aerovox	PA-110
				Centralab	PC-104
				Cornell-Dubilier	11F7M5
				Erie	1405-01
				Sprague	V-1
K3	Horiz. AFC	82mmf, 390mmf, 680mmf, 62mmf, 8200Ω, 10K, 220K, 1meg, 920K	219V003H03	Erie	709-10

RECTIFIERS

ITEM No	RATING CURRENT (Measured)	REPLACEMENT DATA Westinghouse PART No.	FEDERAL PART No.	GENERAL ELECTRIC PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	NOTES
M1	.270A	295V006H01 ①				M500 ①	① Silicon
						350A ②	② Selenium
M2	.270A	295V006H01 ①				M500 ①	③ Two required.
						350A ②	
M3		296V004H01 ②	1N5 ②③		1T1 ②③		

CRYSTAL DIODES

ITEM No	ORIG. TYPE	REPLACEMENT DATA Westinghouse PART No.	CBS PART No.	SYLVANIA PART No.	NOTES
M4	K6 *	1N60	1N60		Video Detector (Pigtail)

* Some versions may use either 1N295 or 1N54 (Part #V-10H2-3) in this application.

MISCELLANEOUS

ITEM No	PART NAME	Westinghouse PART No.	NOTES
M5	Tuner	470V040H01	VHF (Code 395) Ch. V-2373-1
	Tuner	470V041H01	VHF (Code 395) Ch. V-2383-1
	Tuner	470V032H01	UHF -- Ch. V-2383-1
M6	Centering Device	78V101H01	Includes yoke cover

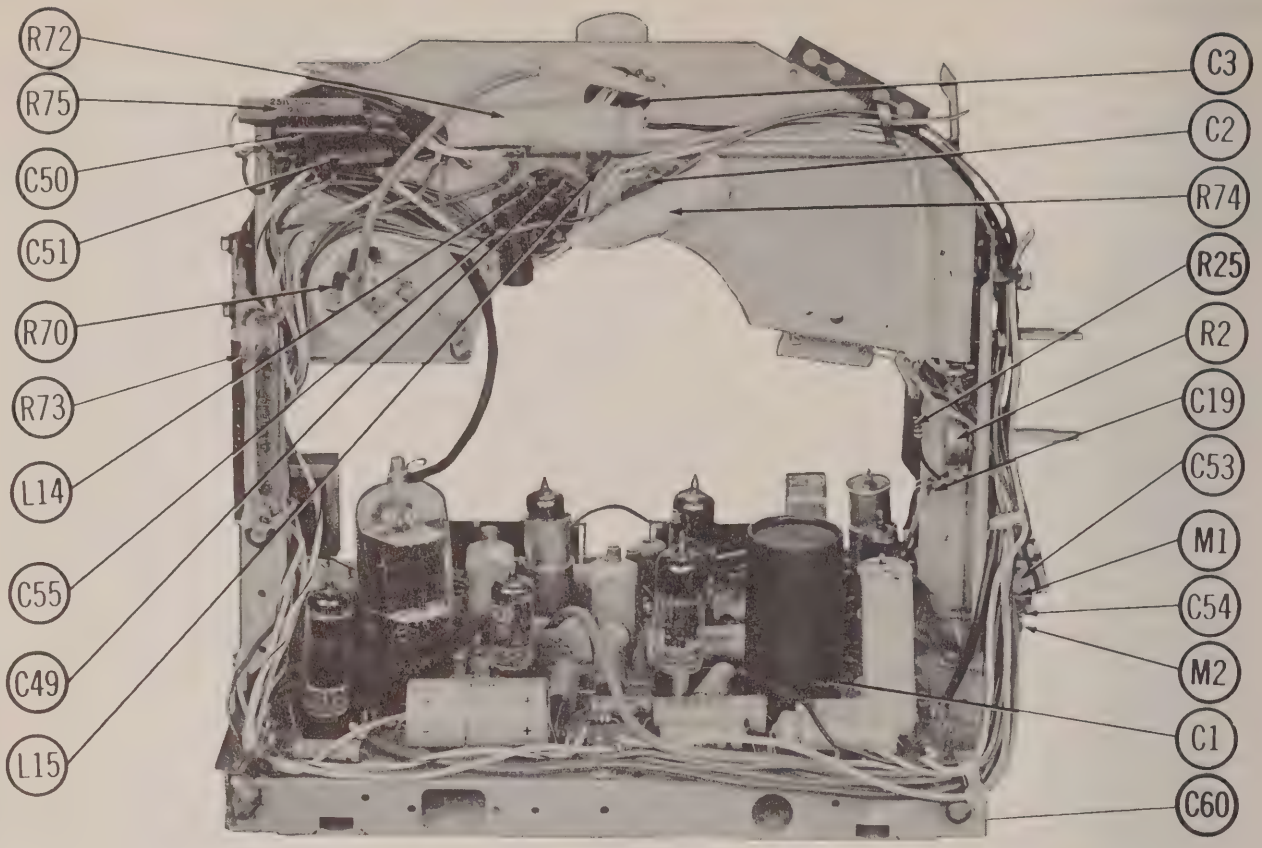
CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

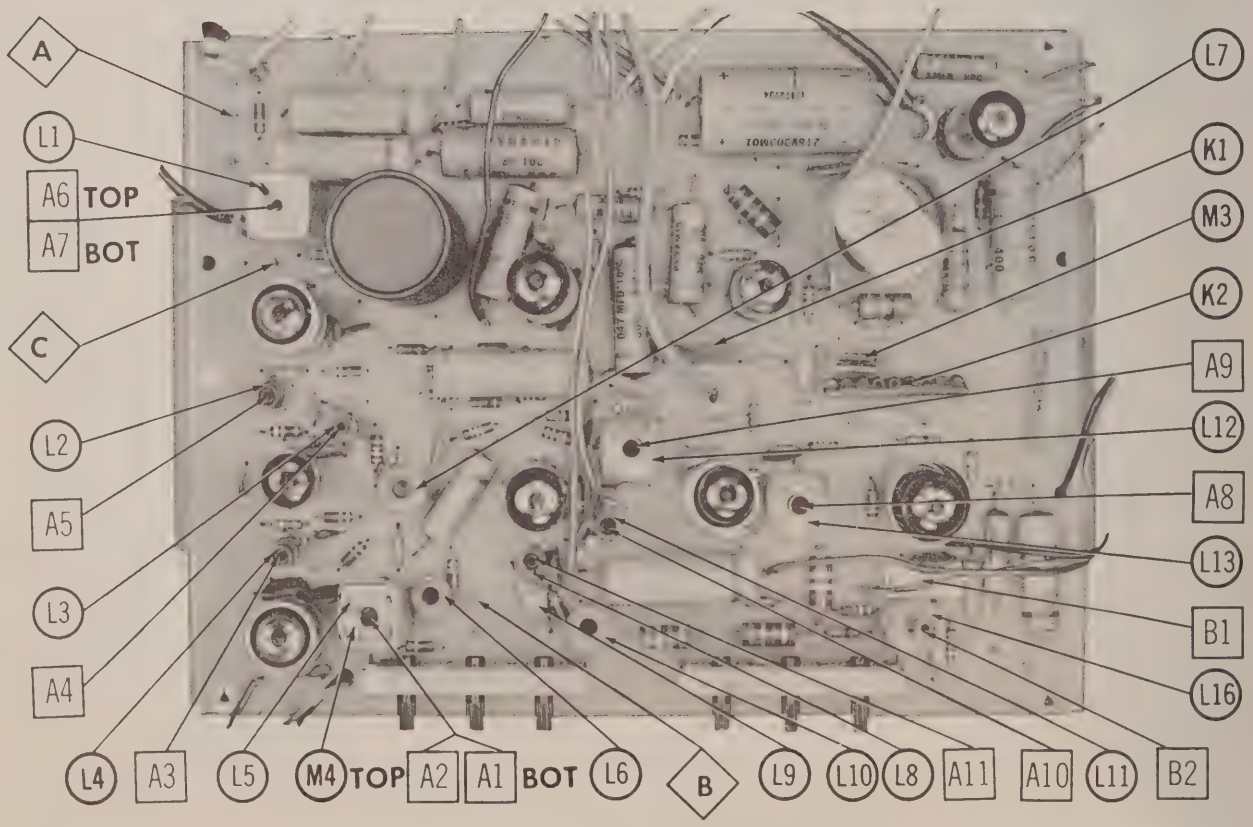
NAME	PART NO.	DESCRIPTION
Safety Glass	629V004H02	
Mask	51DV004H01	
Knob	550V032H1	VHF Channel Selector
Knob	550V032H02	UHF Channel Selector
Knob	550V031H03	VHF Fine Tuning
Knob	550V050H01	UHF Fine Tuning
Knob	550V054H01	On-off-volume
Knob	550V054H02	Contrast
Dial	550V028H06	UHF
Handle	556V063H01	
Antenna	218V022H01	Telescoping
Cabinet	510V034H06	Model H-17T242
Cabinet	510V034H03	Model H-17T241
Cabinet	510V034H04	Model H-17TU241
Cabinet	510V034H05	Model H-17TU243
Cabinet	510V034H07	Model H-17T243
Cabinet	510V034H08	Model H-17TU243
Cabinet	510V034H11	Model H-17T244
Cabinet	510V034H12	Model H-17TU244
Cabinet	510V034H13	Model H-17T245
Cabinet	510V034H14	Model H-17TU245

WIRING DATA

High Voltage Lead	Use BELDEN No. 8869
Shielded Hook-up Wire	Use BELDEN No. 8885 (Single Conductor) 8738 (Two Conductor)
General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8534 (Stranded) Available in Ten Colors
Power Cord (Interlock Type)	Use BELDEN No. 8374
300Ω Tuner Input Lead	Use BELDEN No. 8225
300Ω Antenna Lead-in	Use BELDEN No. 8230 or 8275
Antenna Rotor Cable	Use BELDEN No. 8464 (Trial) or 8484 (Round) - 4 Conductor 8485 (Round) - 5 Conductor 8488 (Round) - 8 Conductor



CHASSIS FRONT VIEW



INDUCTOR & ALIGNMENT IDENTIFICATION

TUNER PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V201	RF Amplifier	3BN4	

ITEM No.	USE	TYPE	NOTES
V202	Mixer-Osc.	6CG8A	

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA						NOTES
	CAP.	VOLT	Westinghouse PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C201	120		690V004H17	BPD-00012	DD-121	L10T12	ED-120	UC-5312	5GA-T12	
C202	30		690V004H18							5%
C203	15		R1CC20C0G150J		TCZ-15	C10Q15C	TCO-15		5TCC-Q15	5%
C204	15		R1CC20C0G150J		TCZ-15	C10Q15C	TCO-15		5TCC-Q15	5%
C205	5		690V004H21	NPO-DI 5	TCZ-4R7	C10V5C	TCO-5	ZT-555	5TCCB-V5	5%
C206	2-8		690V004H24							
C207	800		R2CC61Z5Z801P							
C208	47		690V004H25							
C209	800		R2CC61Z5Z801P							
C210	51		V-8685	NPO-DI 50	TCZ-51	C10Q51C	TCO-51	ZT-545	5TCC-Q5	10%
C211	2-6		690V004H36							
C212	1.0		V-8686	NPO-SI 1.0	TCZ-1		TCO-1		5TCCB-V1	①
C213	1000		690V004H29	BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C214	10		V-19015-1	NPO-DI 10	TCZ-10	C10Q1C	TCO-10	ZT-541	5TCC-Q1	5%
C215	10		V-19015-1	NPO-DI 10	TCZ-10	C10Q1C	TCO-10	ZT-541	5TCC-Q1	5%
C216	1000		690V004H27	BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C217	85		690V007H01							
C218	800		R2CC61Z5Z801P							
C219	1000		690V004H27	BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C220	800		R2CC61Z5Z801P							
C221	2-6		690V004H36							

① Some versionss may use 1.5mmf in this application.

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		Westinghouse PART No.	NOTES
	OHMS	WATT		
R201	4700Ω		250V224A72	
R202	1000Ω		250V221A02	
R203	10K		250V221A03	
R204	220K		250V222A24	

ITEM No.	RATING		Westinghouse PART No.	NOTES
	OHMS	WATT		
R205	1000Ω		250V221A02	
R206	10K		250V221A03	
R207	10K		250V221A03	
R208	5600Ω		250V225A62	

COILS (RF-IF)

ITEM No.	USE	Westinghouse PART No.	NOTES
L201	Ant. Trans.	690V004H41	
L202	IF Trap Coil	690V004H37	
L203	IF Trap Coil	690V004H38	

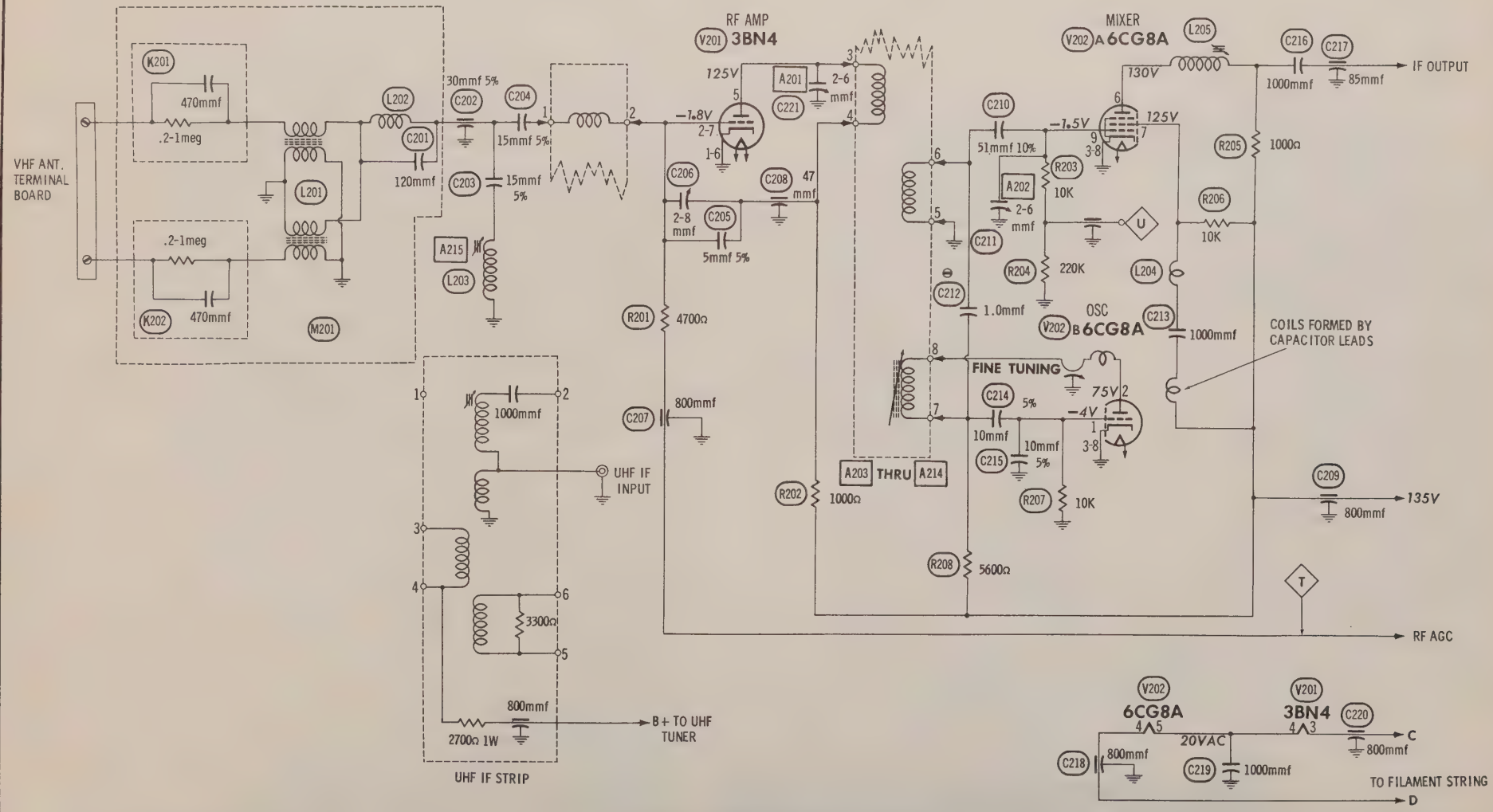
ITEM No.	USE	Westinghouse PART No.	NOTES
L204	RF Choke	690V004H39	
L205	Mixer Plate Coil	690V004H40	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	Westinghouse PART No.	REPLACEMENT DATA	
K201	Antenna Isolation	470mmf, .2-1meg	690V004H42	Centralab	RC-471
K202	Antenna Isolation	470mmf, .2-1meg	690V004H42	Sprague	R-9197

MISCELLANEOUS

ITEM No.	PART NAME	Westinghouse PART No.	NOTES
M201	Ant. Network	690V004H51	Includes K201, K202, L201, L202, C201
M202	Cover Assy.	690V004H49	Includes components & contacts



A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

VHF TUNER PART #470V040H01 (CODE 305) & UHF-VHF TUNER PART #470V041H01 (CODE 305)

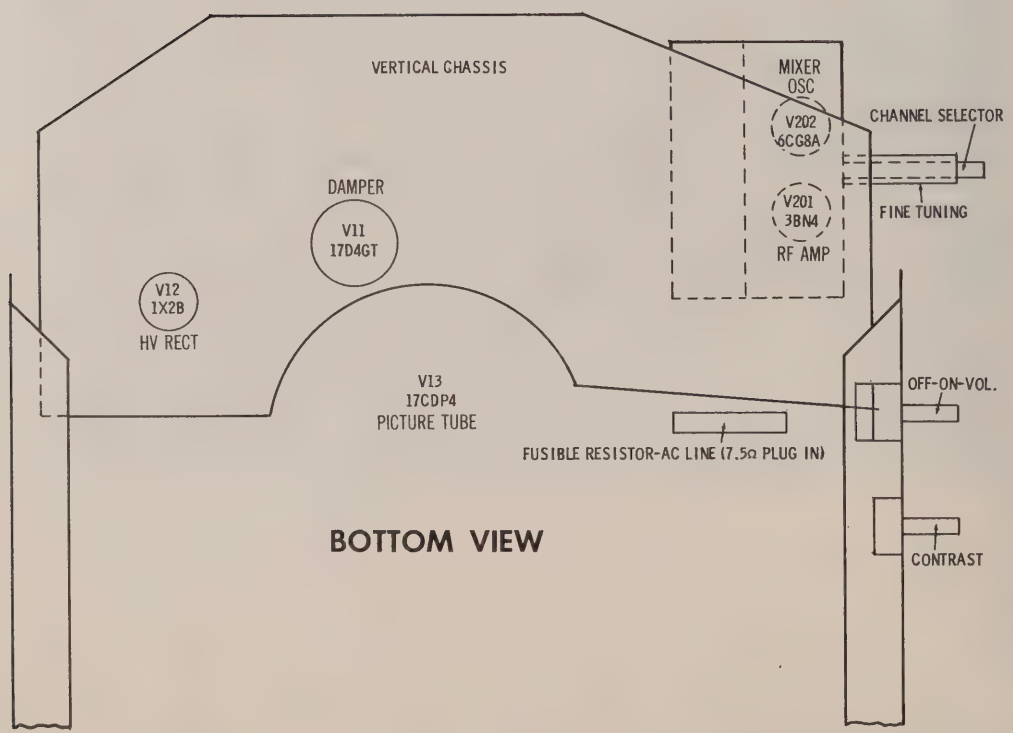
TUNER SCHEMATIC

RESISTOR IDENTIFICATION

RESISTANCE MEASUREMENTS

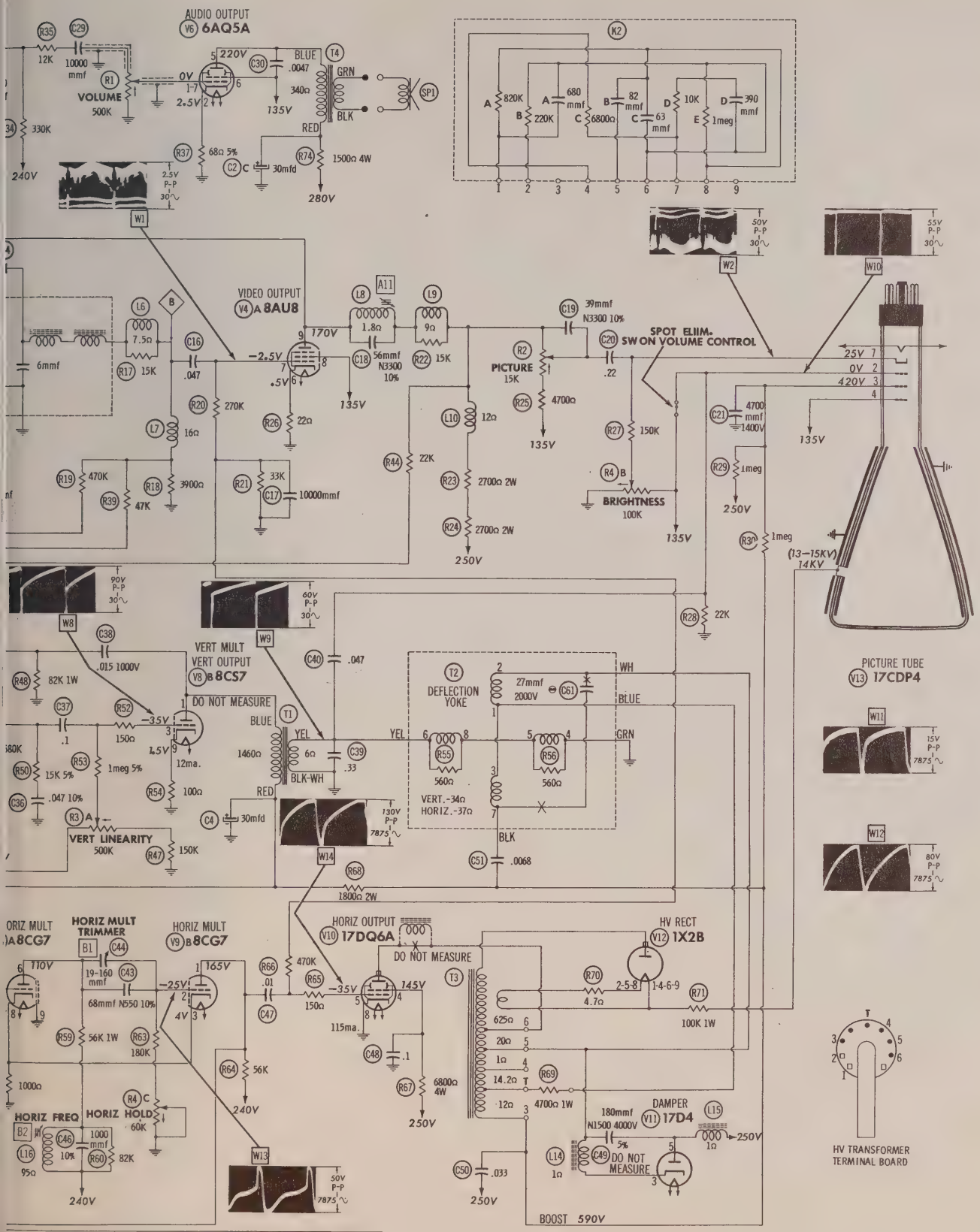
ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	4BZ6	480K	47Ω	11Ω	10Ω	† 2500Ω	† 2500Ω	0Ω		
V2	4BZ6	480K	47Ω	10Ω	9Ω	† 2500Ω	† 2500Ω	0Ω		
V3	4CB6	.1Ω	150Ω	9Ω	8Ω	† 2500Ω	† 2500Ω	0Ω		
V4	8AU8	0Ω	100K	† 49K	14Ω	11Ω	22Ω	300K	† 2000Ω	† 4400Ω
V5	4BN6	• 200Ω	.2Ω	17Ω	18Ω	† 22K	6Ω	† 330K		
V6	6AQ5A	0Ω	68Ω	23Ω	25Ω	† 1840Ω	† 2000Ω	0Ω		
V7	4CS6	27K	0Ω	19Ω	18Ω	† 33K	† 12K	3.2meg		
V8	8CS7	‡3200Ω	NC	• 1.2meg	14Ω	17Ω	† 460K	• 1.1meg	0Ω	100Ω
V9	8CG7	† 57K	• 200K	1000Ω	0Ω	2.5Ω	† 57K	2.5meg	1000Ω	0Ω
V10	17DQ6A	NC	19Ω	NC	† 7000Ω	500K	NC	23Ω	0Ω	TOP CAP ‡21Ω
V11	17D4GT	NC	NC	¶	NC	† 180Ω	NC	29Ω	25Ω	
V12	1X2B	PINS 1 THRU 9 HAVE INFINITE RESISTANCE								TOP CAP ‡645Ω
V13	17CDP4	2.5Ω	22K	‡500K	2000Ω	NC	NC	• 170K	5Ω	
V201	3BN4	0Ω	550K	8Ω	7Ω	† 3000Ω	0Ω	550K		
V202	6CG8A	10K	† 7600Ω	0Ω	5Ω	7Ω	† 3000Ω	† 12K	0Ω	230K

¶ THIS READING CAN VARY GREATLY, (10K MINIMUM), DUE TO THE CONDITION OF THE ELECTROLYTIC CAPACITOR CONNECTED IN THE ASSOCIATED CIRCUIT.
• THIS READING WILL VARY. CONTROL SET FOR NORMAL OPERATION.
† MEASURED FROM 280V SOURCE.
‡ MEASURED FROM PIN 3 OF V13.
NC NO CONNECTION.



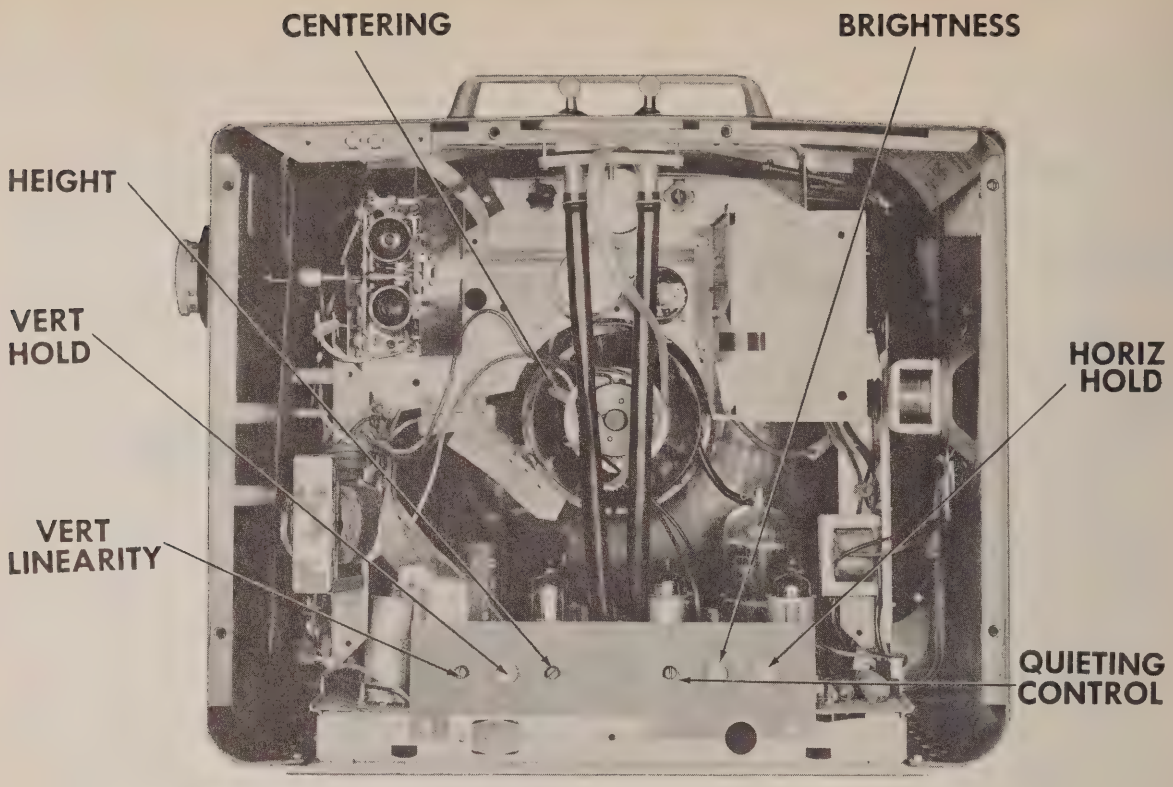
BOTTOM VIEW

TUBE PLACEMENT CHART



3. Measured values are from socket pin to common negative unless other wise stated.
4. Line voltage maintained at 117 volts for voltage readings.
5. All controls set for normal operation; no signal applied.

**WESTINGHOUSE MODELS H-17T241 thru H-17T245,
H-17TU241 thru H-17TU245 (Ch. V-2373-1, V-2383-1)**



CABINET—REAR VIEW

HORIZONTAL SWEEP CIRCUIT ADJUSTMENTS

but not quite reached at one extreme of B1, it may be necessary to set the horizontal hold control SLIGHTLY to one side of mid-range to obtain zero reading on the VTVM.

Remove the clip lead from L16.

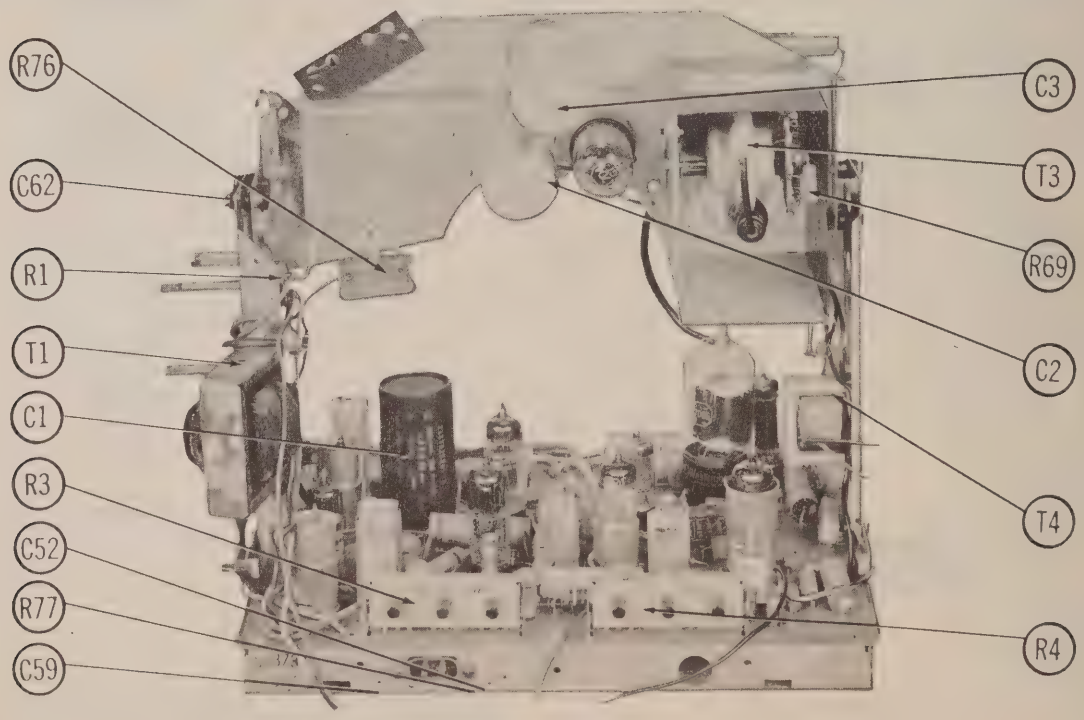
Adjust the horizontal frequency slug (B2) for zero reading on the VTVM and check the adjustment by switching off channel and back again. The receiver should pull into synchronization on all channels. If not, repeat adjustments.

Connect a short clip lead across the horizontal frequency coil (L16). This may be done from the top of the chassis.

Set the horizontal hold control (R4C) to the center of its range.

Connect the DC probe of the VTVM to pin 7 (grid) of the 8CG7 (V9). Common to chassis.

With the receiver tuned to a TV station, adjust the horizontal mult trimmer (B1) for zero reading on the VTVM. If zero can be approached

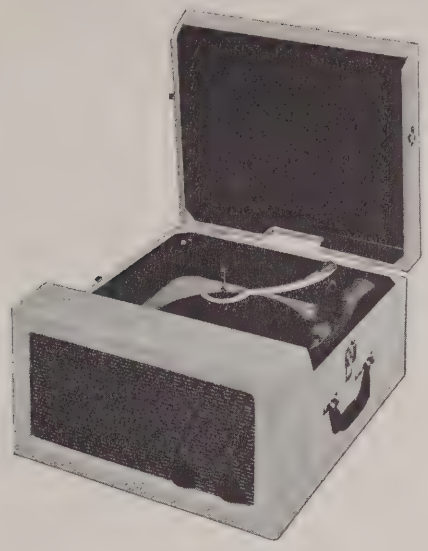


CHASSIS—REAR VIEW

PHOTOFACT* Folder
*TRADE MARK

ADMIRAL
MODELS 3J14, 3J16 (Ch. 3J1)

ADMIRAL
MODELS 3J14, 3J16 (Ch. 3J1)

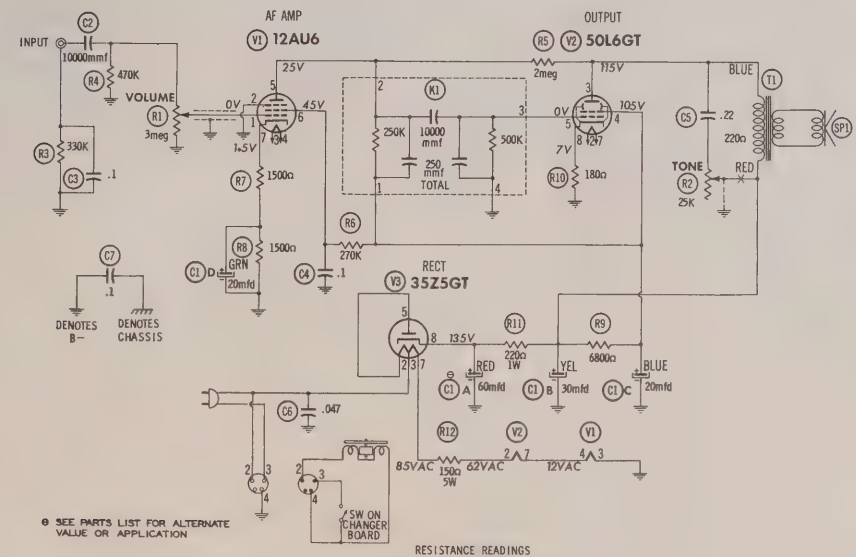


PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

ADMIRAL
MODELS 3J14, 3J16 (Ch. 3J1)

TRADE NAME	Admiral Models 3J14, 3J16 (Ch. 3J1)
MANUFACTURER	Admiral Corp., 3800 W. Cortland St., Chicago 47, Illinois.
TYPE SET	AC Operated Phono Amplifier with 4 Speed Automatic Record Changer
TUBES (Three)	Types 12AU6 AF Amplifier, 50L6GT Output, 35Z5GT Rectifier.
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING .26Amp. @ 117 Volts AC (25 Watts with out Motor)

ADMIRAL RECORD CHANGER MODELS RC606 OR RC606-1 USED IN MODEL 3J14.
ADMIRAL RECORD CHANGER MODELS RC626 OR RC626-1 USED IN MODEL 3J16.



θ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8
V1	12AU6	0Ω	0Ω	0Ω	12Ω	†255K	†275K	3000Ω	
V2	50L6GT	TP	62Ω	†440Ω	†7000Ω	500K	TP	12Ω	180Ω
V3	35Z5GT	NC	230Ω	220Ω	NC	230Ω	NC	190Ω	20K(min)

† MEASURED FROM PIN 8 OF V3
NC NO CONNECTION
TP TIE POINT

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

392-5

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	AF Amplifier	12AU6	
V2	Output	50L6GT	
V3	Rectifier	35Z5GT	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA ADMIRAL PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	60	150	67A37-1 ①		BBRQ53215C	WQ230		T-310	R2471 *
B	30	150				TC45		MT-1520	
C	20	150							
D	20	25							

① In some versions, C1A is 30mfd (C1 Part # 67A14-3)
* Non Catalog Item

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA ADMIRAL PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C2	10000		65D 10-3	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C3	.1	400	64B 1-20	P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1	
C4	.1	400	64B 1-20	P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1	
C5	.22	400	64B 9-24	P488N-22		CUB4P22		GEM-4022	4TM-P22	
C6	.047	400	65A 13-5	P488N-047	DF-503	CUB4S47		GEM-4147	4TM-S47	
C7	.1	400	64B 1-20	P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1	

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA ADMIRAL PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	3meg	½	75C1-78	B-85	A47-3meg-Z	Q13-140	U57	Volume
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	
R2A	25K	½	75C1-76	B-26	A47-25K-S	Q11-120	U29	Tone
B	Shaft			Not Req.	KSS-3	Not Req.	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	ADMIRAL PART No.	NOTES
R3	330K		60B 8-334	
R4	470K		60B 8-474	
R5	2meg		60B 7-205	
R6	270K		60B 8-274	
R7	1500Ω		60B 8-152	
R8	1500Ω		60B 8-152	
R9	6800Ω		60B 8-682	
R10	180Ω		60B 8-181	
R11	220Ω	1	60B 14-221	
R12	150Ω	5	61A 16-5	

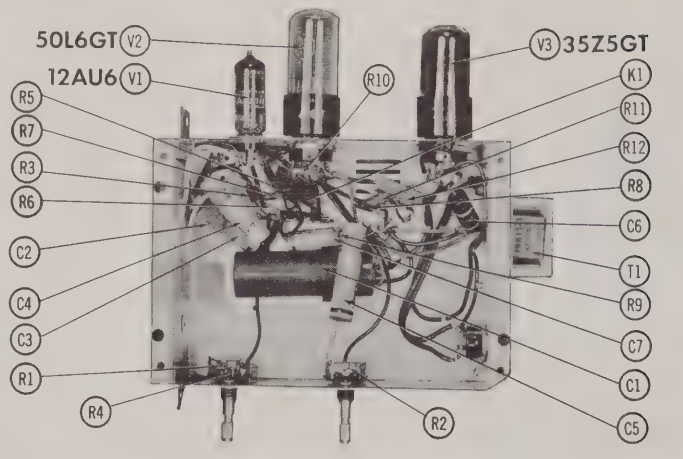
TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	REPLACEMENT DATA ADMIRAL PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	2200Ω	3-4Ω	79A11-3	Z1102	A-2928	A-3876	24S50	S-2X	

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	REPLACEMENT DATA ADMIRAL PART No.	QUAM PART No.	NOTES
SP1	5 1/4"	PM	3-4Ω	78B110-2	5A21	

CHASSIS—BOTTOM VIEW



COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	ADMIRAL PART No.	REPLACEMENT DATA	
K1	Audio Coup. Net.	250mmf, 10000mmf, 250K, 500K.	63A 5-6	Aerovox	PA-112-4
				Centralab	PC-81
				Cornell-Dubilier	113TM2
				Erie	1404-02
				Sprague	T-2

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA ADMIRAL PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. MOUNT	REMARKS
M1	409A17	416-2	N8-2	52-2	PFT-1	Used in Model 3J14
	409B21	55T or 81-TB	GD	56	PT-1	Used in Model 3J16

ASTATIC NEEDLE LISTING SHOWN ABOVE IS SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGE LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA ADMIRAL PART No.	JENSEN PART No.	WALCO PART No.	REMARKS
M2	98C15-29	† CRA-552 or ♦ CRA-552D		Used in Model 3J14
	98C15-44	* JP-35 or † JPS-35 or †♦ JPS-35SD or ♦ JPS-35D	* W35TPA or † W35TPS or †♦ W35DS or ♦ W35TPD	Used in Model 3J16

*Metal † Jewel ♦Diamond

WIRING DATA

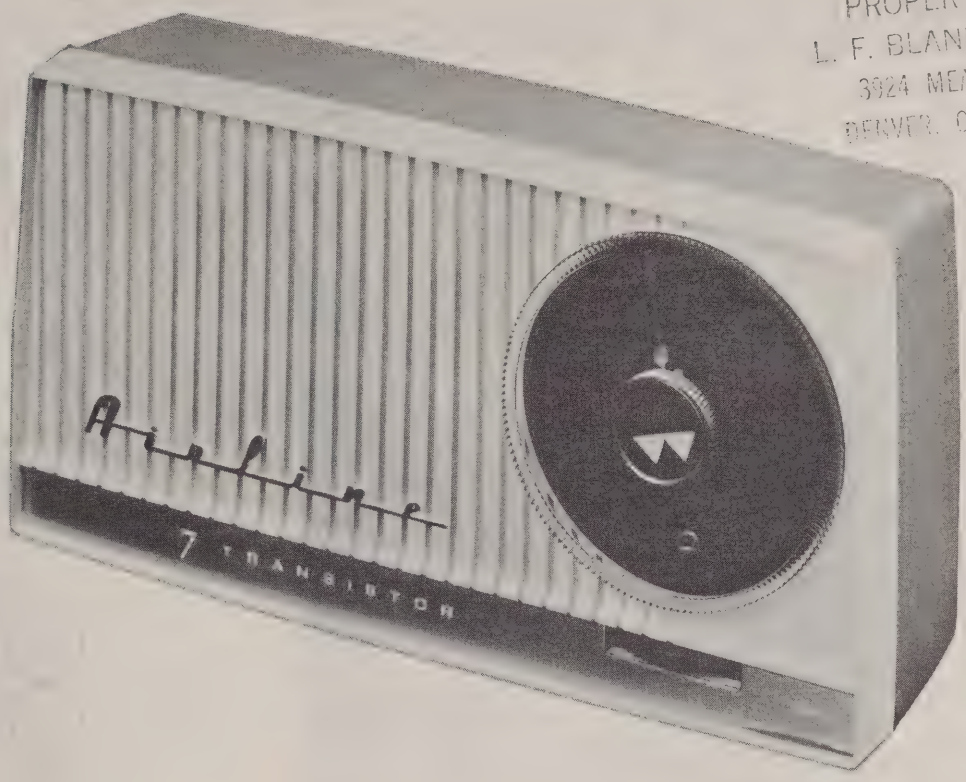
General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)..... Use BELDEN No. 8401
Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)

PHOTOFACT* Folder
*TRADE MARK
EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

AIRLINE MODEL GTM-1109A

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

AIRLINE
MODEL GTM-1109A



AIRLINE
MODEL GTM-1109A

TRADE NAME	Airline Model GTM-1109A
SUPPLIER	Montgomery Ward & Co., 619 Chicago Ave., Chicago, Illinois
TYPE SET	Battery Operated Portable Transistorized Receiver
POWER SUPPLY	9Volts DC RATING 6MA@9 Volts DC
TUNING RANGE—BROADCAST	540-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.		Loop	455KC (400~ Mod.)	Tuning Gang fully open	Across voice coil	A1, A2, A3	Remove Speaker bracket assembly. Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
2.		Loop	1625KC	Tuning Gang fully open	Across voice coil	A4	Replace Speaker bracket assembly. Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		Loop	1400KC	Tune to 1400KC signal.	Across voice coil	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
4.		Loop	600KC	600KC	Across voice coil	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output. Repeat steps 2, 3 and 4 until no further improvement is obtained.

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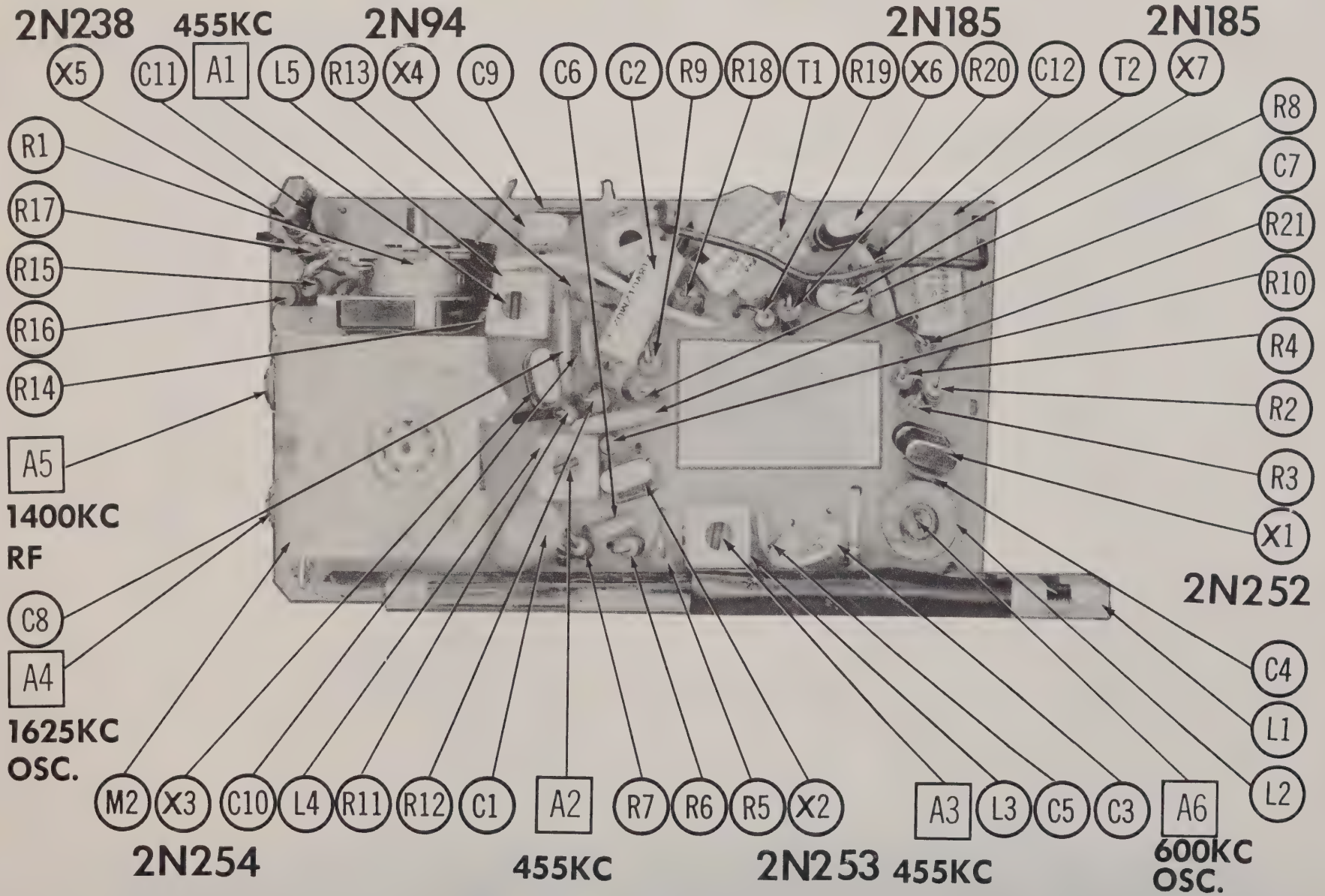


CHASSIS TOP VIEW

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N252	Converter	-	2N414		
X2	2N253	1st. IF Amplifier	2N438			
X3	2N254	2nd. IF Amplifier	2N439			
X4	2N94/880	Det. -AVC-AF Amplifier	2N438		2N94	
X5	2N238/310	AF Amplifier	2N180	2N362		
X6	2N185	Output	2N180	2N360		
X7	2N185	Output	2N180	2N360		

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	AIRLINE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	40	10	218V012H01	PWE10040	NL50-10	TT10X50	ML40-15		R2329 *
C2	40	3	218V012H02	PWE3040	NL40-3	TT3X40	ML40-6		TE-1057

* Non Catalog Item

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	AIRLINE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C3	4700			BPD-0047	DD-472	BYA10D47	ED-0047	UC-5247	5GA-D47	
C4	1000		215V300H15	BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C5	10000		215V300H12						TG-S10	
C6	10000		215V300H12						TG-S10	
C7	2200		215V102A22	BPD-0022	DD-222	BYA10D22	ED-0022	UC-5222	5HK-D22	
C8	50000		215V303H03	BPD-05					TG-S50	
C9	10000		215V300H12						TG-S10	
C10	10000		215V300H12						TG-S10	
C11	1000		215V300H15	BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C12	50000		215V303H03	BPD-05					TG-S50	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	AIRLINE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	5000Ω	½	270V024H01					Volume and Switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		AIRLINE PART No.	NOTES
	OHMS	WATT		
R2	39K			
R3	8200Ω			
R4	4700Ω			
R5	3900Ω			
R6	15K			
R7	1000Ω			
R8	2200Ω			
R9	330Ω			
R10	1000Ω			
R11	15K			

ITEM No.	RATING		AIRLINE PART No.	NOTES
	OHMS	WATT		
R12	470Ω			
R13	3300Ω			
R14	330K			
R15	680Ω			
R16	82K			
R17	220Ω			
R18	6800Ω			
R19	100Ω			
R20	10Ω			
R21	220Ω			

TRANSFORMER (DRIVER)

ITEM No.	TURNS RATIO		REPLACEMENT DATA						NOTES
	PRI.	SEC.	AIRLINE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2.5:	1	430V024M02 ①						① Alternate Part #430V024H01

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	AIRLINE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	1200Ω CT	12Ω	430V025M02 ①						① Alternate Part #430V025H01

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	AIRLINE PART No.	QUAM PART No.	
SP1	2 3/4"	PM	12Ω	570V004H01		

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		AIRLINE PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loop Stick	310V012H03					
L2	Osc. Coil	230V026H01					
L3	1st IF	235V014H01					
L4	2nd.IF	235V014H01					
L5	3rd. IF	235V014H02					

BATTERIES

ITEM No.	VOLTAGE	AIRLINE PART No.	REPLACEMENT DATA								NOTES
			BURGESS		EVEREADY		MALLORY		RAY-O-VAC		
			"A"	"B"	"A"	"B"	"A"	"B"	"A"	"B"	
M1	9V			P6		226		M1600		1600	

MISCELLANEOUS

ITEM No.	PART NAME	AIRLINE PART No.	NOTES
M2	Tuning Cap	330V005H01	2 Gang (Ant. 24-130mmf, Osc. 30-95mmf)

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	550V017H01	On-Off-Volume
Knob	550V033H01	Dial Tuning
Cabinet	513V016H01	Less Dial & Escutcheon
Escutcheon	555V015H01	
Dial	558V078H01	Calibration

WIRING DATA

General-use Unshielded Hook-up Wire .....Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

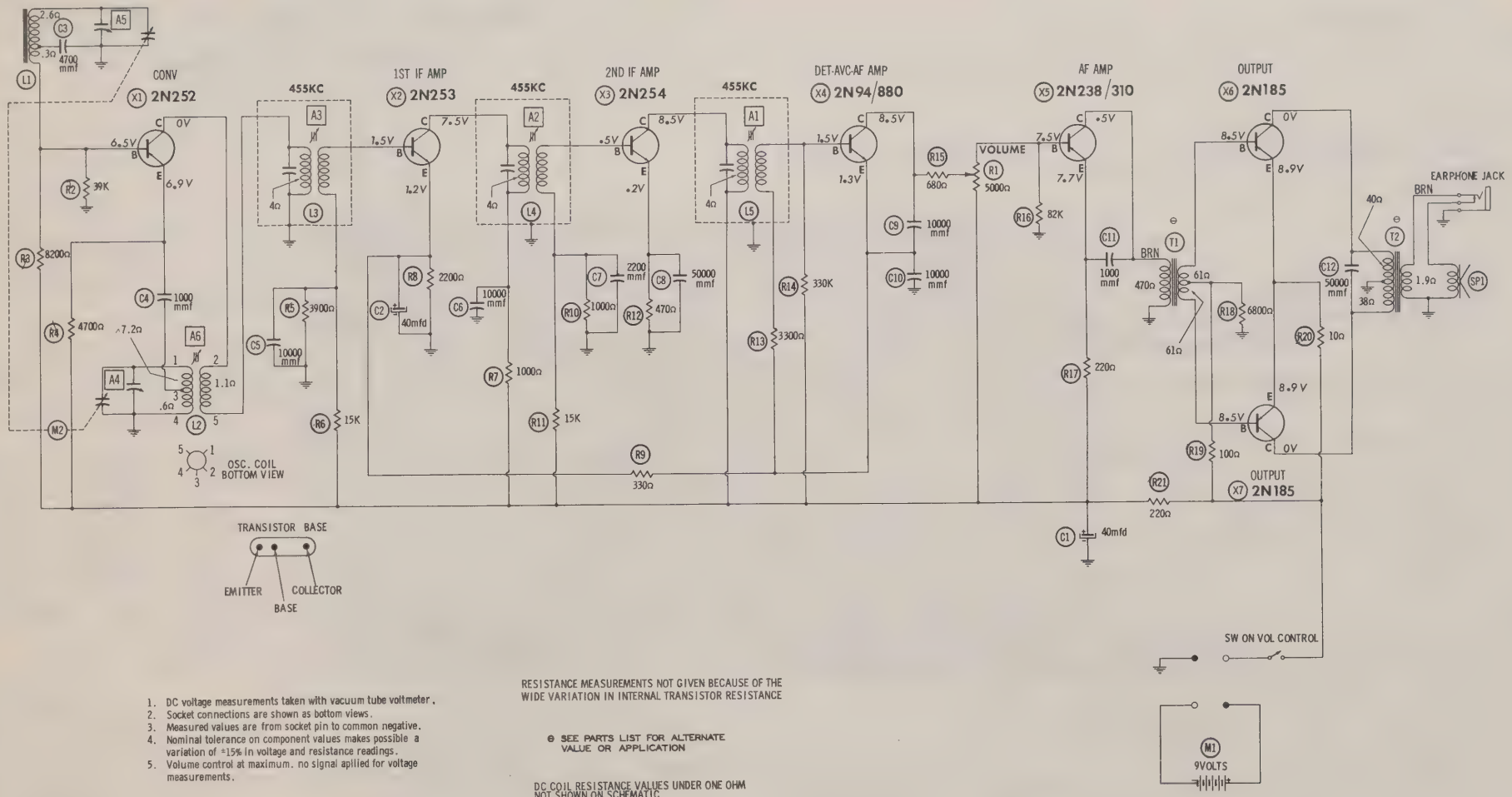
SET 392

FOLDER 6

AIRLINE MODEL GTM-1109A

FOLDER 6

AIRLINE MODEL GTM-1109A



1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum. no signal apllied for voltage measurements.

RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC

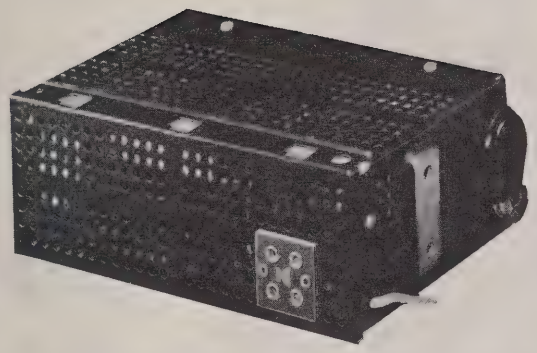
A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

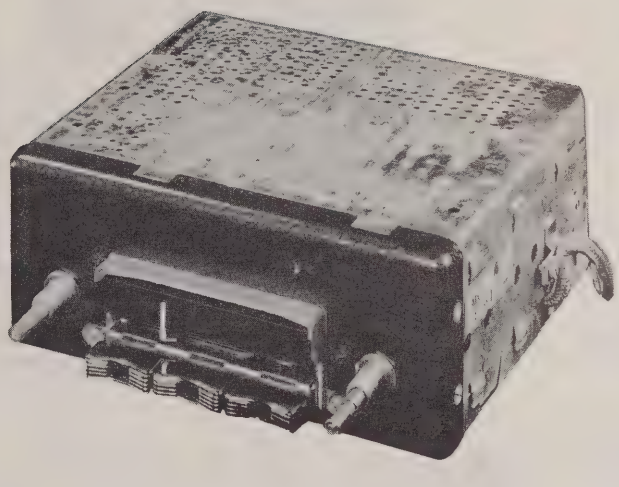
PHOTOFACT* Folder
*TRADE MARK
EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

BLAUPUNKT
MODELS KOLN-12V, KOLN-6V

PROPERTY OF
L. F. BLANKENSHIP
3921 MEADE ST.
DENVER, COLORADO

BLAUPUNKT
MODELS KOLN-12V, KOLN-6V



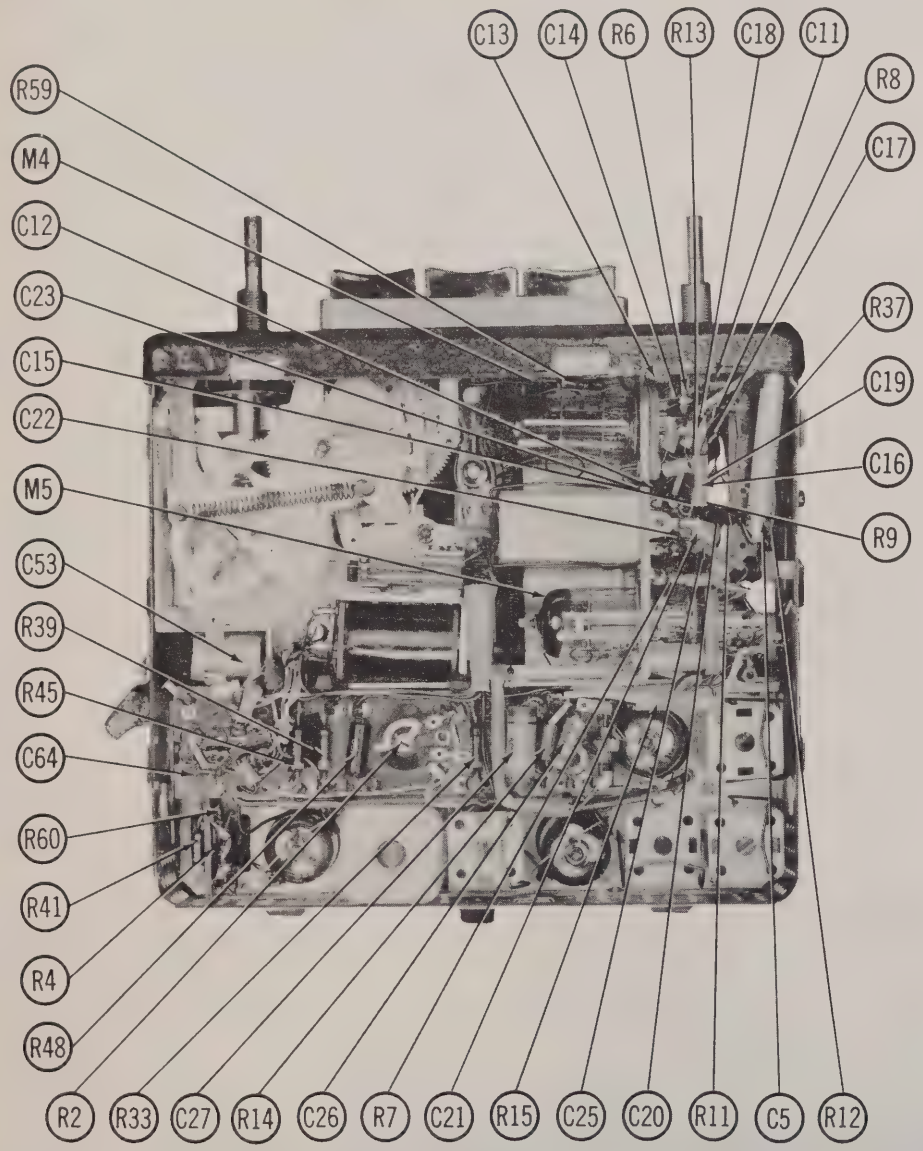


BLAUPUNKT
MODELS KOLN-12V, KOLN-6V

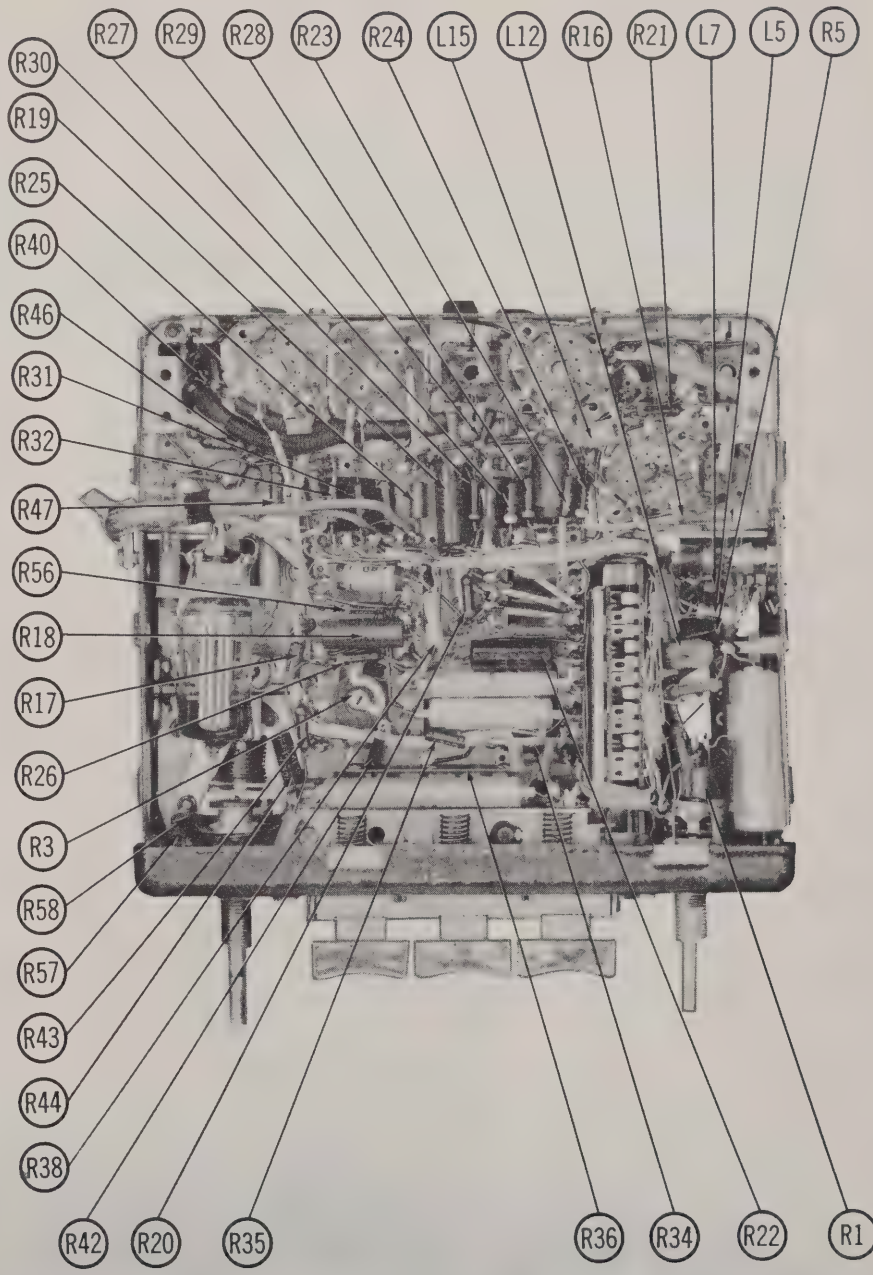
TRADE NAME	Blaupunkt Model Koln		
SUPPLIER	Robert Bosch Corp., 40-25 Crescent St., Long Island City 1, N. Y.		
TYPE SET	Battery Operated Universal Type FM-BC-LW Automobile Receiver		
TUBES (Seven)	Types 6AQ8/ECC85 FM RF Amp.-FM Conv., 6AD6/EF89 1st FM IF Amp.-AM RF Amp., 6AJ8/ECH81 2nd FM IF Amp.-AM Mixer-AM Osc., EBF89 3rd FM-1st AM IF Amp., 6T8/EABC80 Ratio Det.-AM Det.-AVC-AF Amp., 6AQ8/ECC85 Trigger, 6BQ5/EL84 Output		
POWER SUPPLY	12 Volt Storage Battery (12 Volt versions) 6 Volt Storage Battery (6 Volt versions)	RATING	3.8 Amp. @ 12.6 Volts DC 7.6 Amp. @ 6.3 Volts DC
TUNING RANGE	BROADCAST 500KC-1650KC FREQ. MOD. 88MC-108MC	LONG WAVE	150KC-295KC

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

The listing of any available replacement part herein does not constitute in any case a recommendation, warranty or guaranty by Howard W. Sams & Co., Inc., as to the quality and suitability of such replacement part. The numbers of these parts have been compiled from information furnished to Howard W. Sams & Co., Inc., by the manufacturers of the particular type of replacement part listed. Reproduction or use, without express permission, of editorial or pictorial content, in any manner, is prohibited. No patent liability is assumed with respect to the use of the information contained herein. © 1958 Howard W. Sams & Co., Inc., Indianapolis 5, Indiana. Printed in U.S. of America

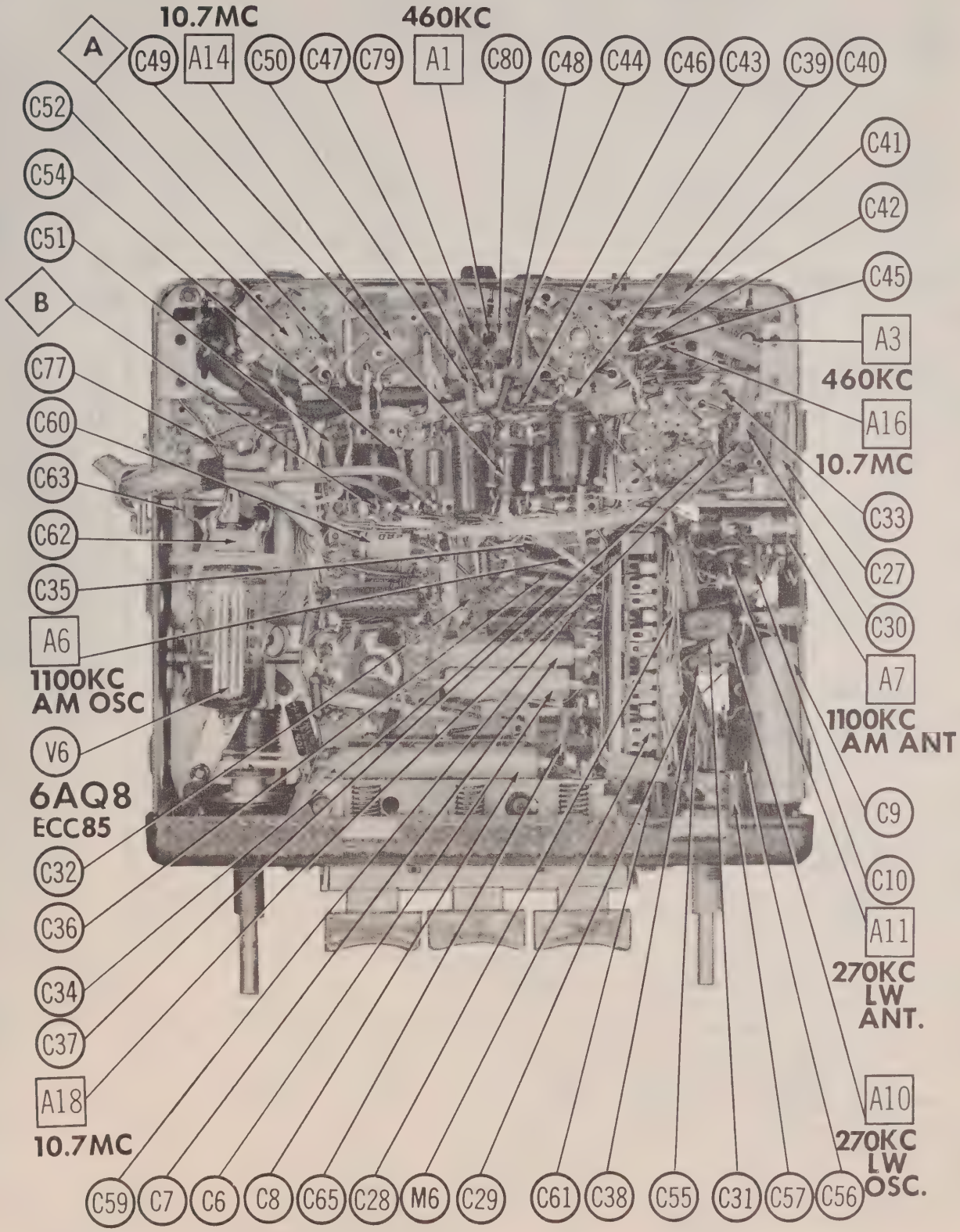


CHASSIS TOP VIEW — CAPACITOR & RESISTOR IDENT



CHASSIS BOTTOM VIEW-RESISTOR AND INDUCTOR IDENT

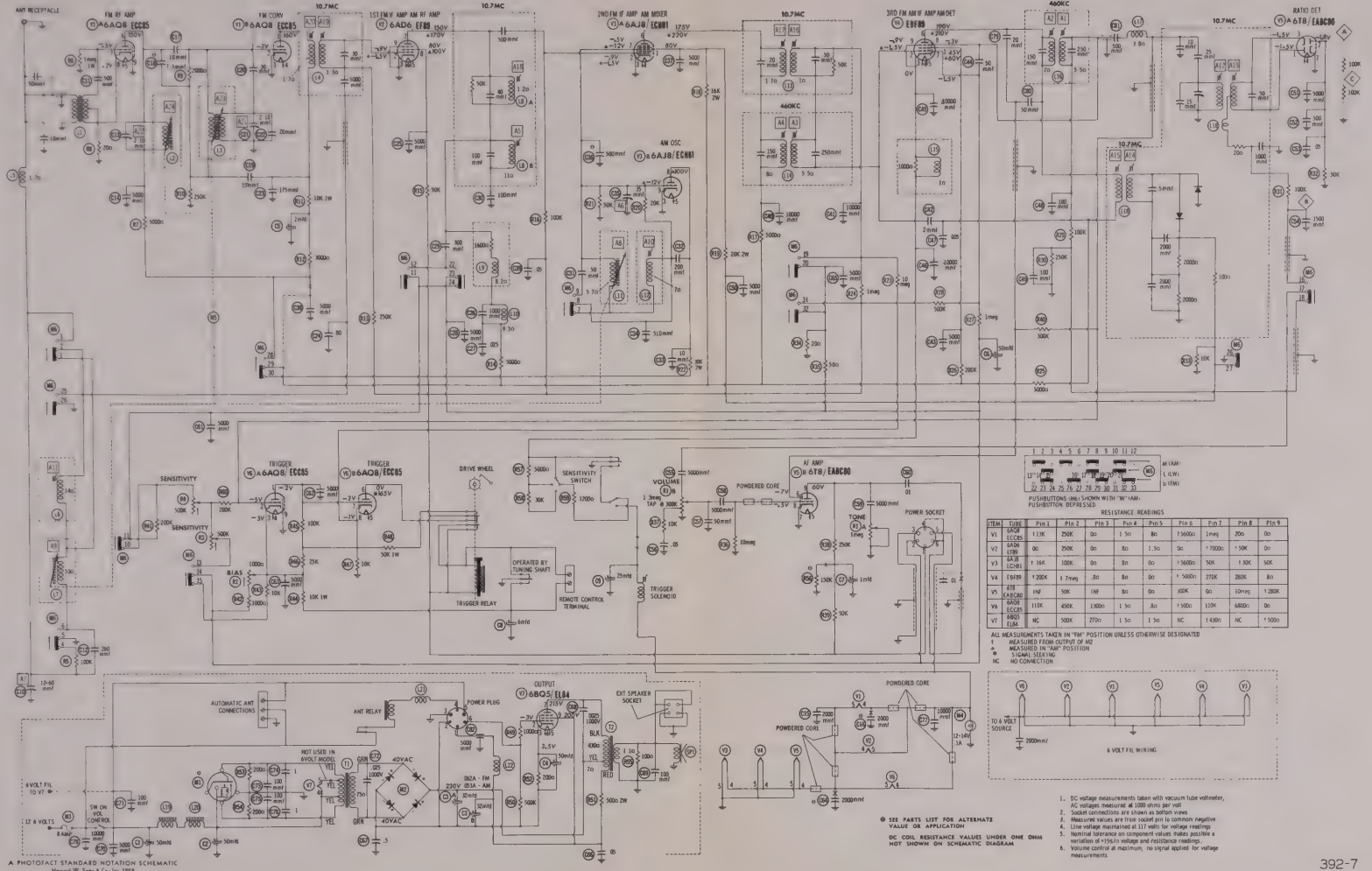
PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO



CHASSIS BOTTOM VIEW-CAPACITOR AND ALIGNMENT IDENTIFICATION

BLAUPUNKT
MODEL KOLN

FOLDER 7



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	6AQ8 ECC85	1.1K	250K	0Ω	1.5Ω	8Ω	†560Ω	1meg	20Ω	0Ω
V2	6AQ8 ECC85	0Ω	250K	0Ω	8Ω	1.5Ω	9Ω	†700Ω	†50K	0Ω
V3	6AJ8 ECH81	† 16K	100K	0Ω	8Ω	0Ω	†560Ω	50K	† 30K	50K
V4	EBF89	†200K	1.7meg	8Ω	8Ω	0Ω	† 500Ω	270K	280K	8Ω
V5	6T8 EABC80	INF	50K	INF	8Ω	0Ω	60K	0Ω	10meg	†280K
V6	6AQ8 ECC85	110K	450K	1300Ω	1.5Ω	8Ω	†500Ω	110K	6800Ω	0Ω
V7	6BQ5 EL84	NC	500K	270Ω	1.5Ω	1.5Ω	NC	†430Ω	NC	†500Ω

ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED
1 MEASURED FROM OUTPUT OF M2
* MEASURED IN "AM" POSITION
S SIGNAL SEEKING
NC NO CONNECTION

⊕ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC DIAGRAM

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt
2. Socket connections are shown as bottom views
3. Measured values are from socket pin to common negative
4. Line voltage maintained at 117 volts for voltage readings
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

392-7

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	Fig. 1	High side to pin 2 (grid) of 6AJ8/ECH81 (V3). Low side to chassis.	460KC (400~ Mod)	AM	Tuning gang fully open	Across voice voice coil	A1, A2 A3, A4	Adjust for maximum output.
2.	"	Thru dummy to antenna receptacle	"	"	"	"	A5	Adjust for MINIMUM output.
3.	"	"	1100KC	"	1100KC	"	A6, A7	Adjust for maximum output.
4.	"	"	550KC	"	550KC	"	A8, A9	Adjust for maximum output.
5.	"	"	270KC	"	270KC	"	A10, A11	Adjust for maximum output.

FM IF ALIGNMENT USING AM SIGNAL GENERATOR & VTVM

Connect two matched 100K (±1%) resistors in series from point Ⓐ to chassis. The junction of these two resistors is alignment point Ⓒ as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
6.	200mmfd	High side to pin 2 (grid) of 6AQ8/ECC85 (V1). Low side to chassis.	10.7MC (Unmod.)	FM	Point of non-interference	DC probe to point Ⓐ. Common to chassis.	A12	Adjust for maximum deflection
7.	"	"	"	"	"	DC probe to point Ⓑ. Common to point Ⓒ.	A13	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
8.	"	"	"	"	"	DC probe to point Ⓐ. Common to chassis.	A14, A15, A16, A17, A18, A19, A20	Adjust for maximum deflection.

FM IF ALIGNMENT FM SIGNAL GENERATOR & OSCILLOSCOPE

Use frequency modulated signal with 60~ modulation and 450KC sweep. Use 120~ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
6.	200mmfd	High side to pin 2 (grid) of 6AQ8/ECC85 (V1). Low side to chassis.	10.7MC (450KC Swp)	FM	Point of non-interference	Vert. amp. to point Ⓐ. Low side to chassis.	A12	Adjust for curve of maximum amplitude and symmetry similar to Fig. 2.
7.	200mmfd	"	"	"	"	Vert. amp. to point B. Low side to chassis.	A13	Adjust so that 10.7MC occurs at center of crossover lines similar to Fig. 3. SLIGHTLY retouch A12 for maximum amplitude and straightness of crossover lines.
8.	"	"	"	"	"	Vert. amp. to point Ⓐ. Low side to chassis.	A14, A15, A16, A17, A18, A19, A20	Adjust for curve of maximum amplitude and symmetry similar to Fig. 2.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
9.	Fig. 1	Thru dummy to antenna receptacle	105MC (Unmod)	FM	105MC	DC probe to point Ⓐ. Common to chassis.	A21, A22	Adjust for maximum deflection.
10.	"	"	90MC	"	90MC	"	A23, A24	Adjust for maximum deflection. Repeat steps 9 & 10 until no further improvement is noted.

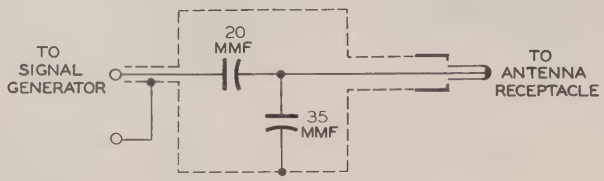


FIG. 1

FIG. 2

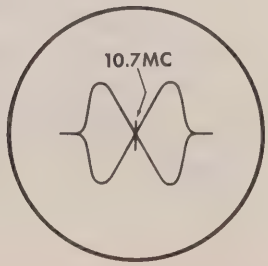
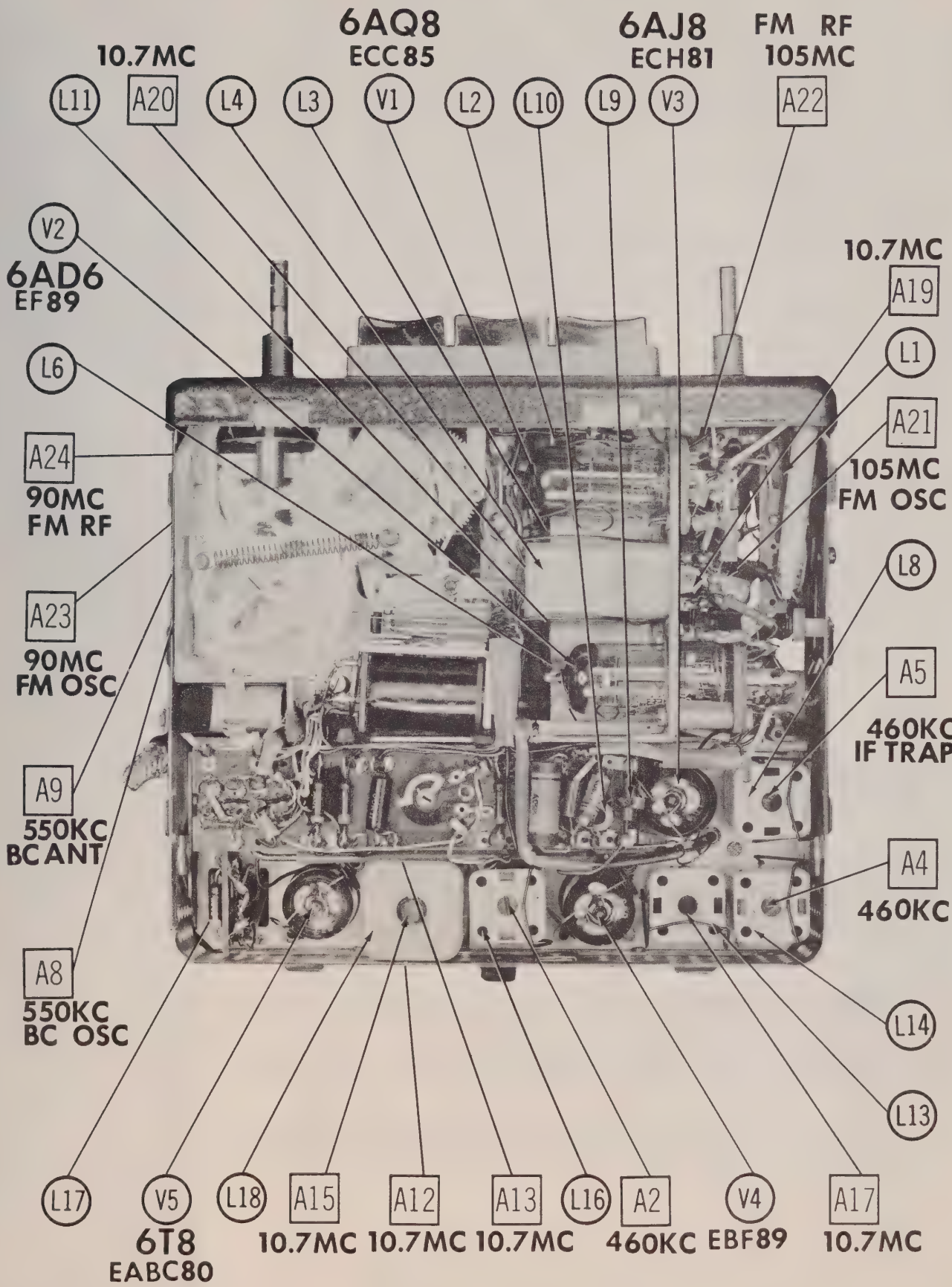


FIG. 3



CHASSIS TOP VIEW – TUBE, INDUCTOR & ALIGNMENT IDENTIFICATION

PARTS LIST AND DESCRIPTIONS
TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE
V1	FM RF Amp. - FM Conv.	6AQ8/ECC85
V2	1st FM IF Amp. - AM RF Amplifier	6AD6/EF89
V3	2nd FM IF Amp. - AM Mixer-AM Osc.	6AJ8/ECH81
V4	3rd FM - 1st AM IF Amp.	EBF89
V5	Ratio Det. - AM Det. - AVC - AF Amp.	6T8/EABC80
V6	Trigger	6AQ8/ECC85
V7	Output	6BQ5/EL84

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA BLAUPUNKT PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	50	18		PRS25V50	BBR50-25	TC29	TD-50-25	MT-0250	TVA-1206
C2	50	18		PRS25V50	BBR50-25	TC29	TD-50-25	MT-0250	TVA-1206
C3A	32	385			B0430			D-255	R2600 *
B	32	385							
C4	50	15		SRE25V50	BBR50-25	TC29	ML50-15		TE-1160
C5	2	385							R2623 *
C6	50	15		SRE25V50	BBR50-25	TC29	ML50-15		TE-1160
C7	1	385							R2622 *
C8	6	275			BBR6-300				R2624 *
C9	25	18		PRS25V25	BBR25-25	TC26	TD-25-25	MT-0225	TVA-1205

* Non Catalog Item

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA BLAUPUNKT PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C10	10-60									
C11	500			BPD-0005	DD-501	L10T5	ED-500	UC-535	5GA-T5	
C12	260									
C13	2-10									
C14	5000			SI 5000	D6-502	LT6D5	GP-5000	UC-525	5GA-D5	
C15	2000			SI 2000	D6-202	LT6D2	GP-2000	UC-522	5GA-D2	
C16	2000			SI 2000	D6-202	LT6D2	GP-2000	UC-522	5GA-D2	①
C17	10			SI 10	D6-100	LT6Q1	GP-10	UC-541	5GA-Q1	
C18	7.5									②
C19	15			SI 15	D6-150	LT6Q15	GP-15	UC-5415	5GA-Q15	
C20	30			SI 30	D6-300	LT6Q3	GP-30	UC-543	5GA-Q3	
C21	2-10									
C22	20			SI 20	D6-200	LT6Q2	GP-20	UC-542	5GA-Q2	
C23	175									
C24	80									
C25	5000			SI 5000	D6-502	LT6D5	GP-5000	UC-525	5GA-D5	

PARTS LIST AND DESCRIPTIONS (Continued)
RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	BLAUPUNKT PART No.	NOTES
R5	100K			
R6	1meg			
R7	5000Ω	1		
R8	20Ω			
R9	2000Ω			
R10	250K			
R11	10K	1		
R12	3000Ω			
R13	250K			
R14	5000Ω			
R15	50K			
R16	100K			
R17	5000Ω			
R18	16K	2		
R19	20K	2		
R20	20K			
R21	50K			
R22	30K	2		
R23	10meg			
R24	1meg			
R25	5000Ω			
R26	200K			
R27	1meg			
R28	500K			
R29	100K			
R30	250K			
R31	100K			
R32	50K			
R33	10K			
R34	20Ω			
R35	50Ω			
R36	10meg			
R37	10K			
R38	250K			
R39	50K			
R40	300K			
R41	200K			
R42	1000Ω			
R43	10K			
R44	10K	1		
R45	100K			
R46	25K			
R47	10K			
R48	50K	1		
R49	1000Ω			
R50	500K			
R51	500Ω	2		
R52	200Ω			
R53	200Ω			
R54	200Ω			
R55	100Ω			
R56	150K			Note 1
R57	5000Ω			
R58	30K			
R59	1200Ω			
R60	200K			

Note 1. Not used in some versions.

TRANSFORMER (VIBRATOR)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	REPLACEMENT DATA BLAUPUNKT PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	12.6V ⓐ 1.5A Tap ⓐ 6.3V ⓐ 2.3A	240V ⓐ .053A			TF-722/9Z					

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	TURNS RATIO PRI.	TURNS RATIO SEC.	REPLACEMENT DATA BLAUPUNKT PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	30:	1	TF27/53Z						

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA BLAUPUNKT PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C26	1000			SI 1000	D6-102	LT6D1	GP-1000	UC-521	5GA-D1	
C27	.025	500		P688N-025	DD-203	CUB6S22		GEM-6125	6TM-S22	
C28	5000			SI 5000	D6-502	LT6D5	GP-5000	UC-525	5GA-D5	
C29	300			SI 300	D6-301	LT6T3	GP-300	UC-533	5GA-T3	
C30	100			SI 100	D6-101	LT6T1	GP-100	UC-531	5GA-T1	
C31	50			SI 50	D6-500	LT6Q5	GP-50	UC-545	5GA-Q5	
C32	200			D1-0002	D6-201	LT6T2	GP-200	UC 532	5GA-T2	
C33	10			SI 10	D6-100	LT6Q1	GP-10	UC-541	5GA-Q1	
C34	510									
C35	35									
C36	500									③
C37	5000			SI 5000	D6-502	LT6D5	GP-5000	UC-525	5GA-D5	
C38	5000			SI 5000	D6-502	LT6D5	GP-5000	UC-525	5GA-D5	
C39	.05	250		P488N-05	DF-503	CUB4S5		GEM-415	4TM-S5	
C40	10000			SI 10000	D6-103	LT6S1	GP-10000	DC511	5GA-S1	
C41	10000			SI 10000	D6-103	LT6S1	GP-10000	DC511	5GA-S1	
C42	2			NPO-SI 2.2	TCZ-2R2	C10V2C	TCO-2.2		5TCCB-V22	
C43	5000			SI 5000	D6-502	LT6D5	GP-5000	UC-525	5GA-D5	
C44	50			SI 50	D6-500	LT6Q5	GP-50	UC-545	5GA-Q5	
C45	10000			SI 10000	D6-103	LT6S1	GP-10000	DC511	5GA-S1	
C46	10000			SI 10000	D6-103	LT6S1	GP-10000	DC511	5GA-S1	
C47	.005	500		P688N-005	D6-502	CUB6D5	GP-5000	GEM-625	6TM-D5	
C48	100			SI 100	D6-101	LT6T1	GP-100	UC-531	5GA-T1	
C49	100			SI 100	D6-101	LT6T1	GP-100	UC-531	5GA-T1	
C50	5000			SI 5000	D6-502	LT6D5	GP-5000	UC-525	5GA-D5	
C51	5000			SI 5000	D6-502	LT6D5	GP-5000	UC-525	5GA-D5	
C52	500			SI 500	D6-501	LT6T5	GP-500	UC-535	5GA-T5	
C53	.05	250		P488N-05	DF-503	CUB4S5		GEM-415	4TM-S5	
C54	1500			SI 1500	D6-152	LT6D15	GP-1500	UC-5215	5GA-D15	
C55	5000			SI 5000	D6-502	LT6D5	GP-5000	UC-525	5GA-D5	
C56	.05	250		P488N-05	DF-503	CUB4S5		GEM-415	4TM-S5	
C57	50			SI 50	D6-500	LT6Q5	GP-50	UC-545	5GA-Q5	
C58	5000			SI 5000	D6-502	LT6D5	GP-5000	UC-525	5GA-D5	
C59	5000			SI 5000	D6-502	LT6D5	GP-5000	UC-525	5GA-D5	
C60	.01	500		P688N-01	D6-103	CUB6S1	GP-10000	GEM-611	6TM-S1	
C61	5000			SI 5000	D6-502	LT6D5	GP-5000	UC-525	5GA-D5	
C62	5000			SI 5000	D6-502	LT6D5	GP-5000	UC-525	5GA-D5	
C63	5000			SI 5000	D6-502	LT6D5	GP-5000	UC-525	5GA-D5	
C64	2000			SI 2000	D6-202	LT6D2	GP-2000	UC-522	5GA-D2	①
C65	5000			SI 5000	D6-502	LT6D5	GP-5000	UC-525	5GA-D5	
C66	.05	500		P688N-05	DF-503	CUB6S5		GEM-615	6TM-S5	
C67	.5	250		P488N-5		CUB4P5		GEM-405	4TM-P5	
C68	.0025	1000		P1088N-0022		CUB10D22		GEM-10225	10TM-D22	
C69	100			SI 100	D6-101	LT6T1	GP-100	UC-531	5GA-T1	
C70	5000			SI 5000	D6-502	LT6D5	GP-5000	UC-525	5GA-D5	
C71	100			SI 100	D6-101	LT6T1	GP-100	UC-531	5GA-T1	
C72	.025	1000		P1088N-025		CUB10S22		GEM-10125	10TM-S22	
C73	100			SI 100	D6-101	LT6T1	GP-100	UC-531	5GA-T1	
C74	.1	250		P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1	
C75	100			SI 100	D6-101	LT6T1	GP-100	UC-531	5GA-T1	
C76	.1	250		P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1	
C77	10000			SI 10000	D6-103	LT6S1	GP-10000	DC511	5GA-S1	
C78	10000			SI 10000	D6-103	LT6S1	GP-10000	DC511	5GA-S1	
C79	20			BPD-00002	DD-200	L10Q2	ED-20	UC-542	5GA-Q2	
C80	50									
C81	500			BPD-0005	DD-501	L10T5	ED-0005	UC-535	5GA-T5	
C82	5000									

① Not used in some versions.
② Some versions may use 19mmf in this application.
③ Some versions may use 480mmf in this application.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA BLAUPUNKT PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1meg	1/2						Tone
B	1.3meg	1/2						Volume, Tap ② 300K
C	Switch							
R2	1000Ω	1/4						Bias
R3	500K	1/4						Sensitivity
R4	500K	1/4						Sensitivity

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA BLAUPUNKT PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	FM Ant. Trans.						
L2	FM RF Coil						
L3	FM Osc. Coil						
L4	1st FM IF						
L5	AM Ant. Coil						
L6	AM Ant. Coil						
L7	AM Ant. Coil						
L8A	2nd FM IF						
B	IF Trap						
L9	RF Choke						Wound on 1600Ω resistor
L10	RF Choke						
L11	AM Osc. Coil						
L12	AM Osc. Coil						
L13	3rd FM IF						
L14	1st AM IF						
L15	RF Choke						Wound on 1000Ω resistor
L16	2nd AM IF						
L17	RF Choke						
L18	Ratio Det.						
L19	Hash Choke						
L20	Hash Choke						
L21	RF Choke						
L22	RF Choke						

VIBRATOR

ITEM No.	TYPE	INPUT VOLTS	FREQUENCY	REPLACEMENT DATA BLAUPUNKT PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	RADIART PART No.	NOTES
M1	Interrupter	12.6V	115∿	844/2Z ①				① 12 Volt versions
	Interrupter	6.3V	115∿	844/1Z ②				② 6 Volt versions

RECTIFIER

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA BLAUPUNKT PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	NOTES
M2	.062A	B250C125			D-56 ①	① Silicon Type

FUSE

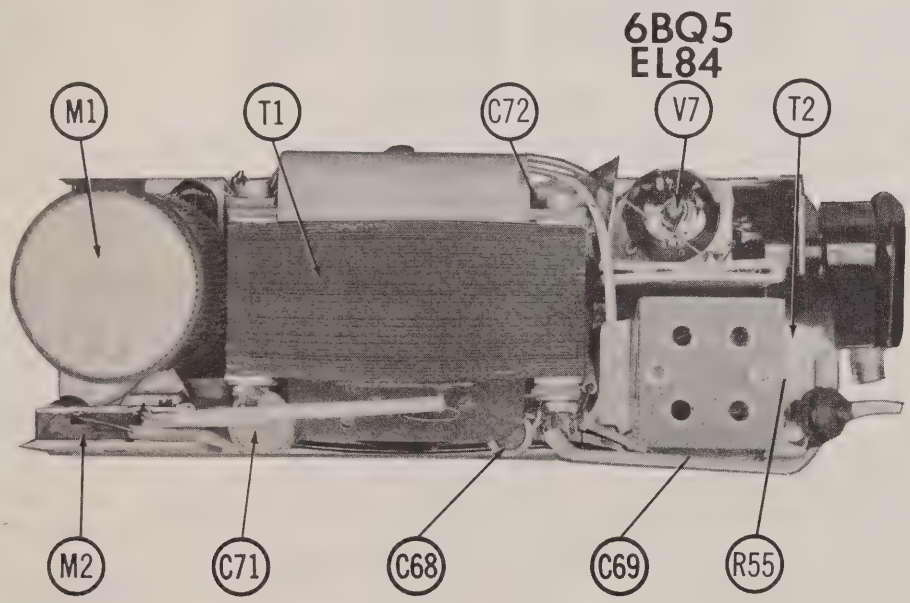
ITEM No.	TYPE	RATING	REPLACEMENT DATA BLAUPUNKT PART No. FUSE	BLAUPUNKT PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M3		8A						

MISCELLANEOUS

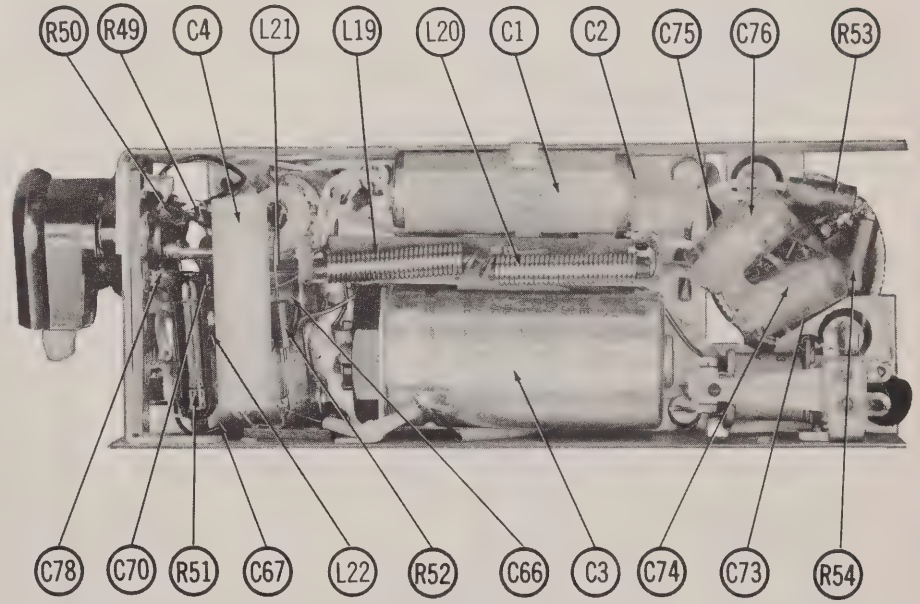
ITEM No.	PART NAME	BLAUPUNKT PART No.	NOTES
M4	Dial Lamp		12-14V 0.1 Amp.
M5	Tuning Unit		FM-AM (Slug Tuning Type)
M6	Switch		FM-BC-LW (Multiple Contact Slide Type)

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors
Shielded Hook-up Wire ..... Use BELDEN No. 8885
Bonding Strap ..... Use BELDEN No. 8661



POWER CHASSIS — TOP VIEW



POWER CHASSIS — BOTTOM VIEW

PHOTOFACT* Folder
*TRADE MARK
EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

DAVID BOGEN MODEL L330

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

DAVID BOGEN
MODEL L330

DAVID BOGEN
MODEL L330

TRADE NAME	David Bogen Model L330
MANUFACTURER	David Bogen Co., Inc., P. O. Box 500, Paramus, N. Y.
TYPE SET	AC Operated 6 Channel 30 Watt Audio Amplifier
TUBES	NINE
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING .92 Amp. @ 117 Volts AC (100 Watts)

VOLTAGE REGULATOR ADJUSTMENT (R6)

The voltage regulator (R6) should be adjusted if V5, V6 or V7 tubes are replaced.

1. Set "Volt. Reg." control (R6) and volume controls (R1, R2, R3) at minimum. Allow the amplifier to warm up for four minutes.
2. Using an accurate low range DC voltmeter, connect the positive lead to terminal 1 of the "CUR MON" test strip. Connect the negative lead to ground.
3. Turn the voltage regulator (R6) for a SLIGHT meter deflection. Measure the voltage at terminal 1 and terminal 2 on the "CUR MON" strip. Keep the meter connected to that terminal which measures the highest voltage.
4. Turn the voltage regulator (R6) until the meter indicates .25 volt.

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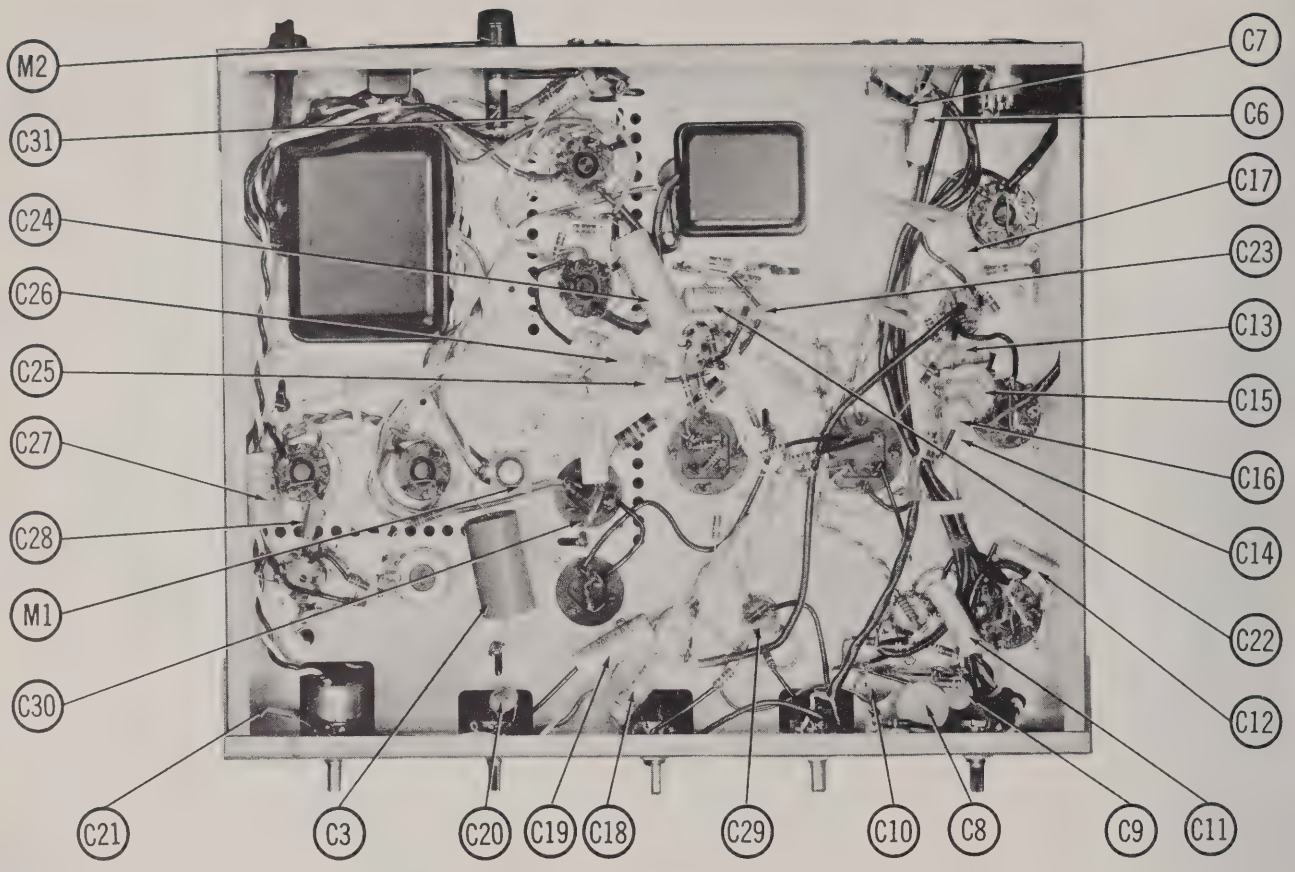
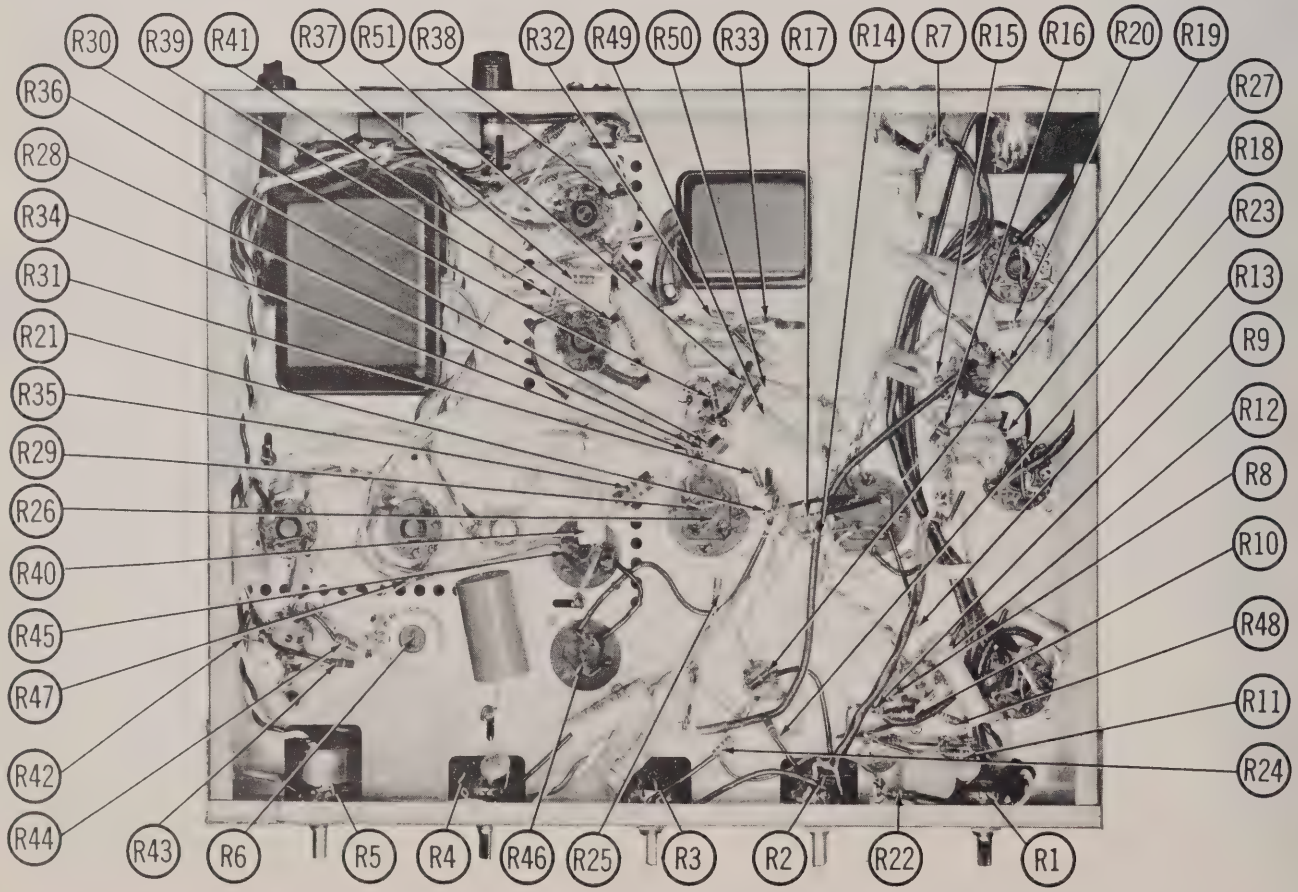
H299

FOLDER 8



CHASSIS-BOTTOM VIEW-CAPACITOR IDENTIFICATION



CHASSIS-BOTTOM VIEW-RESISTOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Phono Preamp-Mic 1 Preamp	12AX7	
V2	Mic 2 Preamp-Mic 3 Preamp	12AX7	
V3	AF Mixer	6AV6	
V4	AF Amp. -Phase Inv.	6U8	
V5	Output	6AV5GA	
V6	Output	6AV5GA	
V7	Volt Regulator	6CG7	
V8	Rectifier	5Y3GT	
V9	Rectifier	5Y3GT	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	REPLACEMENT DATA David Bogen PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	30	400		AFH1-51	A0470	FP145	TMS-56	S-265	TVL-1720
C2	30	400		AFH1-51	A0470	FP145	TMS-56	S-265	TVL-1720
C3	50	100		PRS150V50	BR5015	TC49	TD-50-150	MT-1550	TVA-1414
C4A	■5	200	①	AFH4-09	D0080	WP433. 6	TMQ-9	Q-610	TVL-4759. 7
B	▲5	200	①						
C	5	200							
D	▰5	200							
C5A	▲10	350		AFH4-19-10	D0690	FP474. 5	TMQ-12	Q-035 MT-4510	R2290 *
B	10	350	②						
C	■20	450							
D	▰20	450							

① In some versions, C4A is 10mfd & C4B is not used.
② In some versions, C5B is not used.
* Non Catalog Item

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

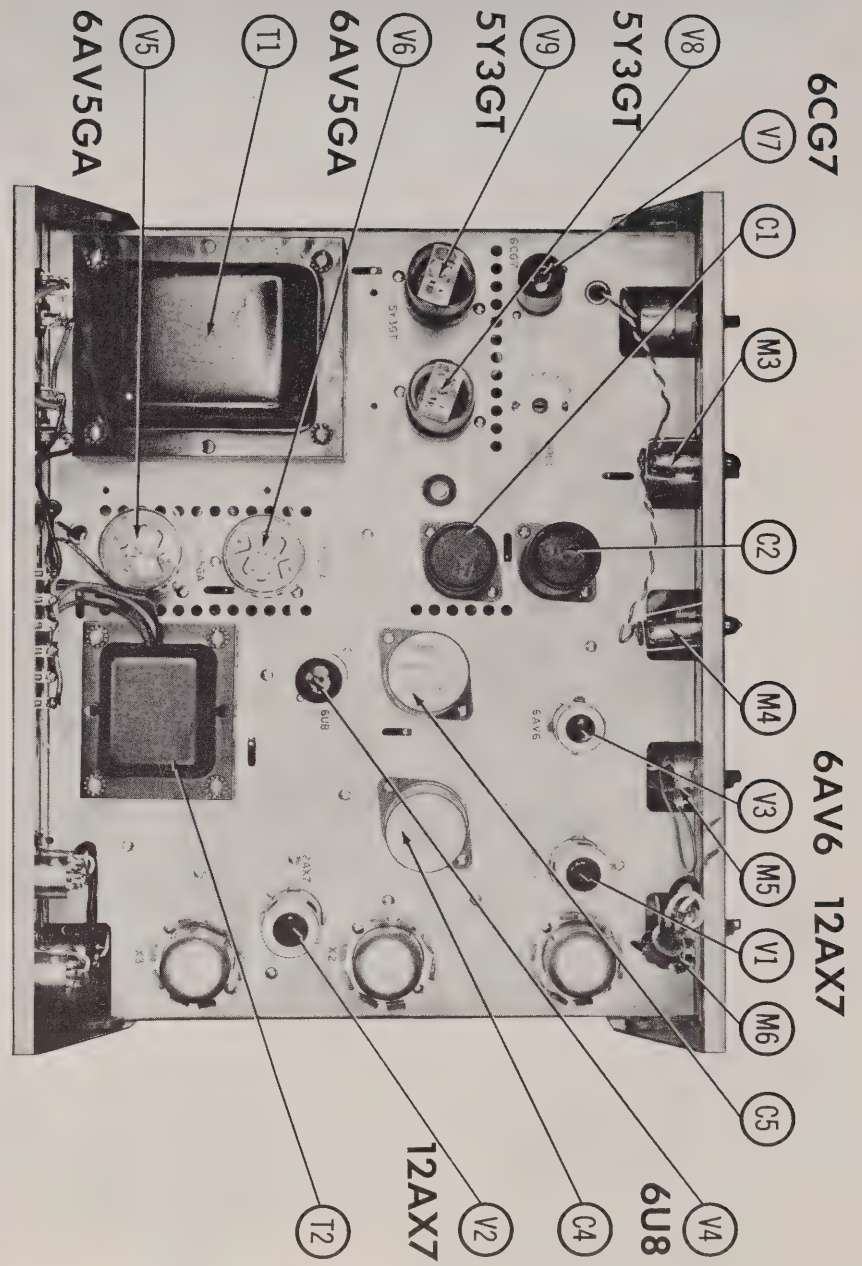
ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA David Bogen PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C6	.033	200		P288N-033	DF-303	CUB6S33		GEM-4133	6TM-S33	
C7	68			NPO-DI 68	DD-680	L10Q68	ED-68		MS-468	10%
C8	4700					1R5D47			MS-247	10%
C9	1500					1R5D15	ED-1500		MS-215	10%
C10	15000			BPD-015	DD16-153	BYA10S15	ED-015		5HK-S15	
C11	.047	200		P288N-047	DF-503	CUB2S47		GEM-4147	2TM-S47	
C12	.033	200		P288N-033	DF-303	CUB6S33		GEM-4133	6TM-S33	
C13	.033	200		P288N-033	DF-303	CUB6S33		GEM-4133	6TM-S33	
C14	.047	200		P288N-047	DF-503	CUB2S47		GEM-4147	2TM-S47	
C15	4700					1R5D47			MS-247	10%
C16	1500					1R5D15	ED-1500		MS-215	10%
C17	.033	200		P288N-033	DF-303	CUB6S33		GEM-4133	6TM-S33	
C18	.047	200		P288N-047	DF-503	CUB2S47		GEM-4147	2TM-S47	
C19	.1	200		P288N-1	DF-104	CUB2P1		GEM-201	2TM-P1	
C20	820					1R5T82	ED-820		MS-382	10%
C21	3300					1R5D33			MS-233	10%
C22	.068	200		P288N-068		CUB6S68		GEM-4168	4TM-S68	①
C23	100			NPO-DI 100	DD-101	L10T1	ED-100	MCB235	MS-31	10%
C24	.1	600		P688N-1	DF-104	CUB6P1		GEM-601	6TM-P1	
C25	.1	600		P688N-1	DF-104	CUB6P1		GEM-601	6TM-P1	
C26	3300	1000								10%
C27	.1	400		P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1	
C28	15000			BPD-015	DD16-153	BYA10S15	ED-015		5HK-S15	
C29	10000			BPD-01	DD-103	BYA10S1M	ED-01	DC511	5HK-S1	
C30	15000			BPD-015	DD16-153	BYA10S15	ED-015		5HK-S15	
C31	.047	600		P688N-047	DF-503	CUB6S47		GEM-6147	6TM-S47	

① Some versions may use . 047mfd in this application.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA David Bogen PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	500K	½	V367	B-60	A47-500K-Z	Q13-133	U48	Input
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R2A	500K	½	V367	B-60	A47-500K-Z	Q13-133	U48	Mic 2
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	

CHASSIS—TOP VIEW



PARTS LIST AND DESCRIPTIONS (Continued)

CONTROLS (cont)

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	David Bogen PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R3A	500K	½	V367	B-60	A47-500K-Z	Q13-133	U48	Mic 3
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R4A	1.5meg	½	V407	B-76	A47-2meg-Z	Q13-139	U55	Bass
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R5A	500K	½	V377	B-60-S	A47-500K-Z	Q13-133	U48	Treble
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
C	Switch			Not Req.	SWE-12	76-1	US-26	
R6A	100K	½	V392	AB-40 *	A47-100K-S *	B11-128	TA15L	Volt Reg
B	Shaft			AK-1	FKS-1/4	TM1-Kit	Not Req.	

* Enlarge mounting hole to 3/8".

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		David Bogen PART No.	NOTES
	OHMS	WATT		
R7	100K			
R8	1.5meg			
R9	100K			
R10	150K			
R11	56K			
R12	3.3meg			
R13	100K			
R14	100K			
R15	3.3meg			
R16	100K			
R17	47K			
R18	180K			
R19	3.3meg			
R20	100K			
R21	47K			
R22	220K			
R23	220K			
R24	270K			
R25	68K			
R26	33K			
R27	1000Ω			
R28	470K			
R29	15K			

ITEM No.	RATING		David Bogen PART No.	NOTES
	OHMS	WATT		
R30	390K			
R31	390Ω			
R32	22K			
R33	22K			
R34	100K			
R35	27K	2		
R36	150K	2		
R37	220K			
R38	15Ω 5%			
R39	220K			
R40	1000Ω	7		
R41	15Ω 5%			
R42	1meg			
R43	2.7meg			
R44	680K			
R45	1meg			
R46	1meg			
R47	68K			
R48	390K			
R49	.47Ω			
R50	.47Ω			
R51	150K			

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	David Bogen PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ .92A	860VCT @ .068A Tap @ 38V @ .001A	5V @ 4A	6.3VCT 4.5A	T3154					

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.1	David Bogen PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	5000Ω CT	167Ω or 70V SEC.2 16Ω Tap @ 8Ω,4Ω	T2128						

RECTIFIER

ITEM No.	RATING	REPLACEMENT DATA				NOTES
	CURRENT (Measured)	David Bogen PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	
M1	.001A	H373	1263A	RS065	10	

FUSE

ITEM No.	TYPE	RATING	REPLACEMENT DATA					
			David Bogen PART No.		LITTELFUSE PART No.		BUSS PART No.	
			FUSE	HOLDER	FUSE	HOLDER	FUSE	HOLDER
M2	3AG	3A 125V S/B			313003. (3AG 3A 125V S/B)	342001	MDX3	HKP

MISCELLANEOUS

ITEM No.	PART NAME	David Bogen PART No.	NOTES
M3	Pilot Light		#47
M4	Pilot Light		#47
M5	Switch	S381	Speech Filter (Slide Type SPDT)
M6	Switch	S475	Selector (Slide Type DPDT)

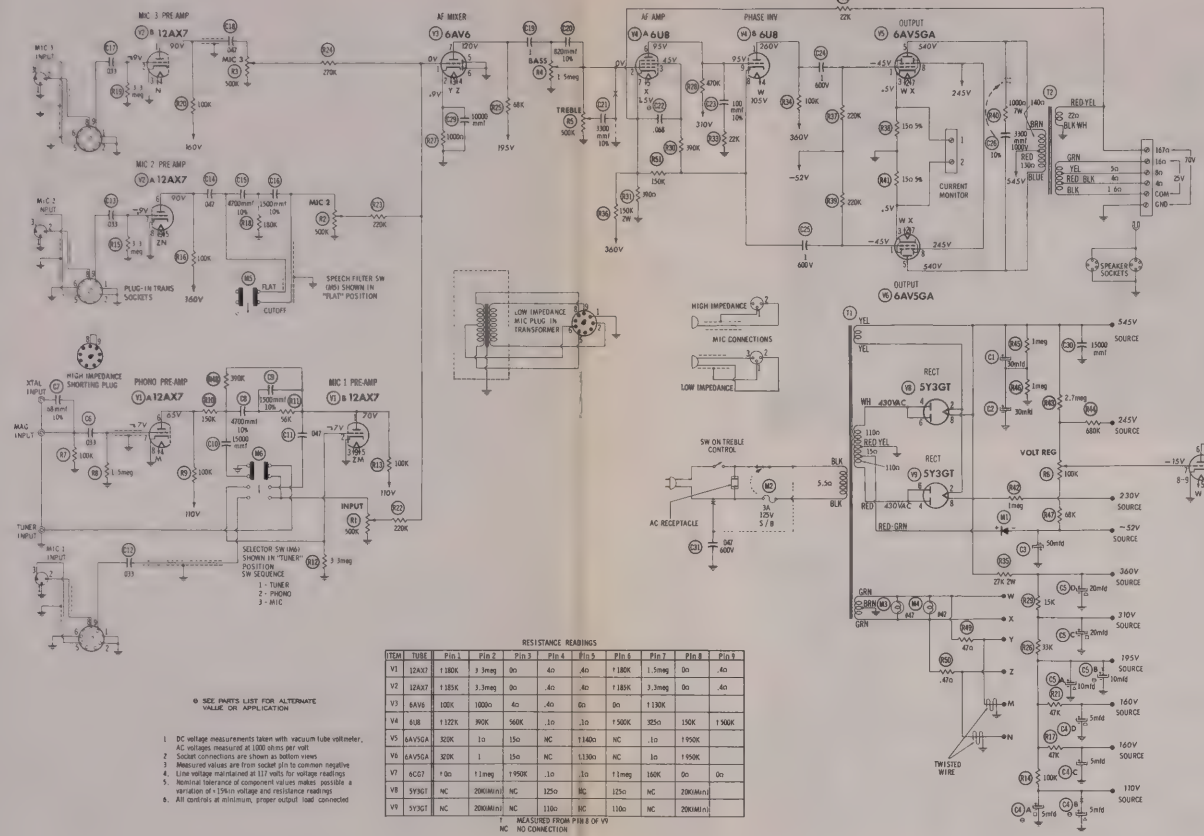
WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)

Low-Loss Shielded Lead (Interconnecting)..... Use BELDEN No. 8401

Phono Pick-up Arm Cable ..... Use BELDEN No. 8430 (Two Conductor - Twisted)



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7	Pin 8	Pin 9
V1	12AX7	†180K	3.3meg	0Ω	4Ω	.4Ω	†180K	1.5meg	0Ω	.4Ω
V2	12AX7	†185K	3.3meg	0Ω	.4Ω	.4Ω	†185K	3.3meg	0Ω	.4Ω
V3	6AV6	100K	1000Ω	4Ω	.4Ω	0Ω	0Ω	†130K		
V4	6U8	†122K	390K	560K	.1Ω	.1Ω	†560K	325Ω	150K	†500K
V5	6AV5GA	320K	1Ω	15Ω	NC	†140Ω	NC	.1Ω	†950K	
V6	6AV5GA	320K	1	15Ω	NC	†130Ω	NC	1Ω	†950K	
V7	6CG7	†0Ω	†1meg	†950K	.1Ω	.1Ω	†1meg	160K	0Ω	0Ω
V8	5Y3GT	NC	20KΩMin	NC	125Ω	NC	125Ω	NC	20KΩMin	
V9	5Y3GT	NC	20KΩMin	NC	110Ω	NC	110Ω	NC	20KΩMin	

† MEASURED FROM PIN 8 OF V9
NC NO CONNECTION

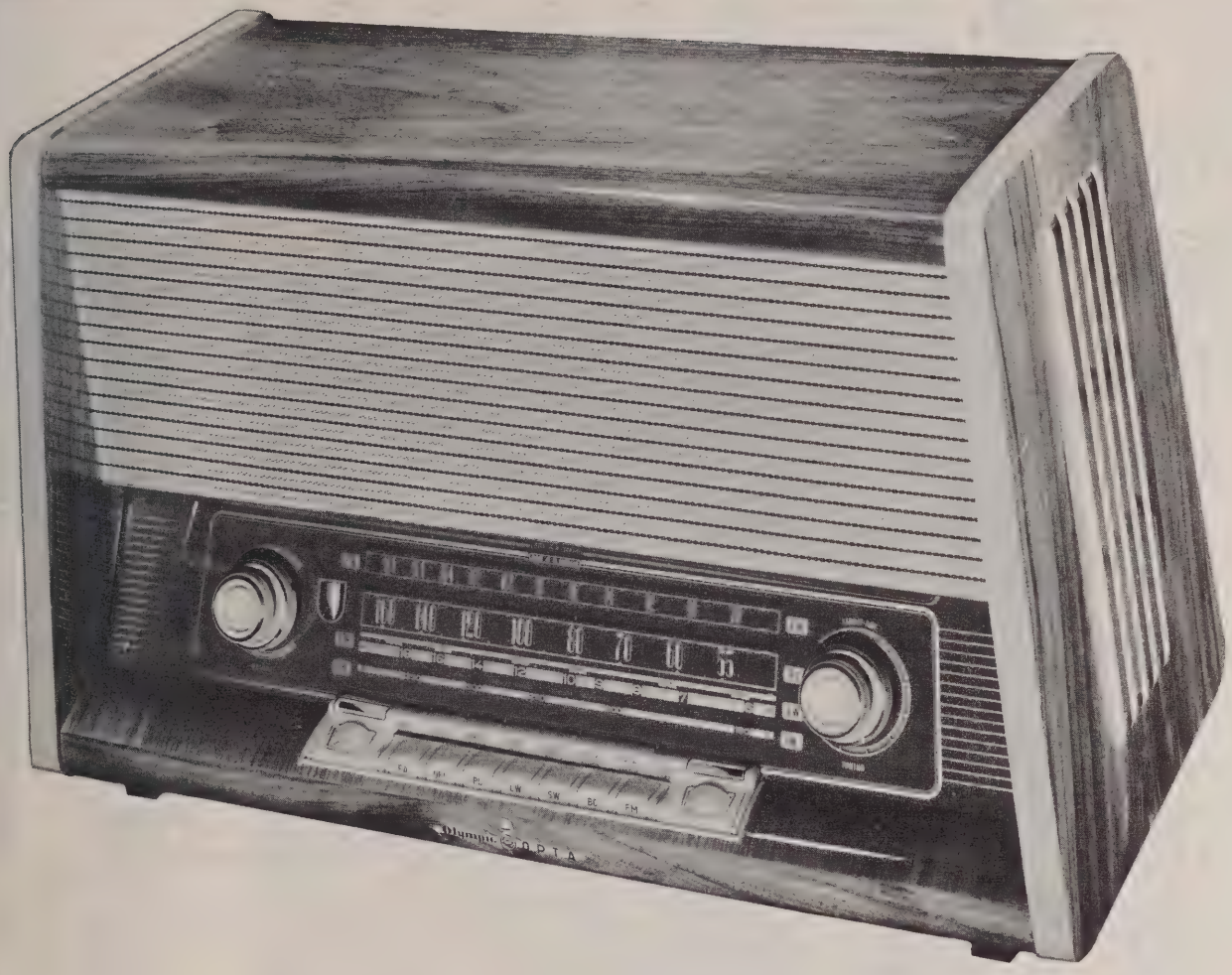
◎ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

1. DC voltage measurements taken with vacuum tube voltmeter, AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views
3. Measured values are from socket pin to common negative
4. Line voltage maintained at 117 volts for voltage readings
5. Nominal tolerance of component values makes possible a variation of ±15% in voltage and resistance readings
6. All controls at minimum, proper output load connected

PHOTOFACT* Folder
*TRADE MARK

OLYMPIC MODELS "Modera" 5783W, "Meteor" 5781W

OLYMPIC MODELS "Modera" 5783W, "Meteor" 5781W



OLYMPIC MODELS "Modera" 5783W, "Meteor" 5781W

TRADE NAME	Olympic Models "Meteor" 5781W, "Moderna" 5783W		
MANUFACTURER	Olympic Radio & Tel. Corp., 34-01 38th Ave., Long Island City 1, N. Y.		
TYPE SET	AC Operated FM-BC-SW Receiver		
TUBES (Six)	Types 6AQ8/ECC85 FM RF Amp.-FM Conv., 6AJ8/ECH81 1st FM IF Amp.-AM Mixer-AM Osc., 6BY7/EF85 2nd FM IF Amp.-1st AM IF Amp., 6T8/EABC80 Ratio Det.-AM Det.-AVC-AF Amp., 6BR5/EM80 Tuning Indicator, 6BQ5/EL84 Output		
POWER SUPPLY	110-120 Volts AC-60 Cycles	RATING	.56 Amp. @ 117 Volts AC (57 Watts)
TUNING RANGE	BROADCAST 530-1620KC LONG WAVE 150-360KC	FREQ. MOD.	88-108MC SHORT WAVE 6-16MC

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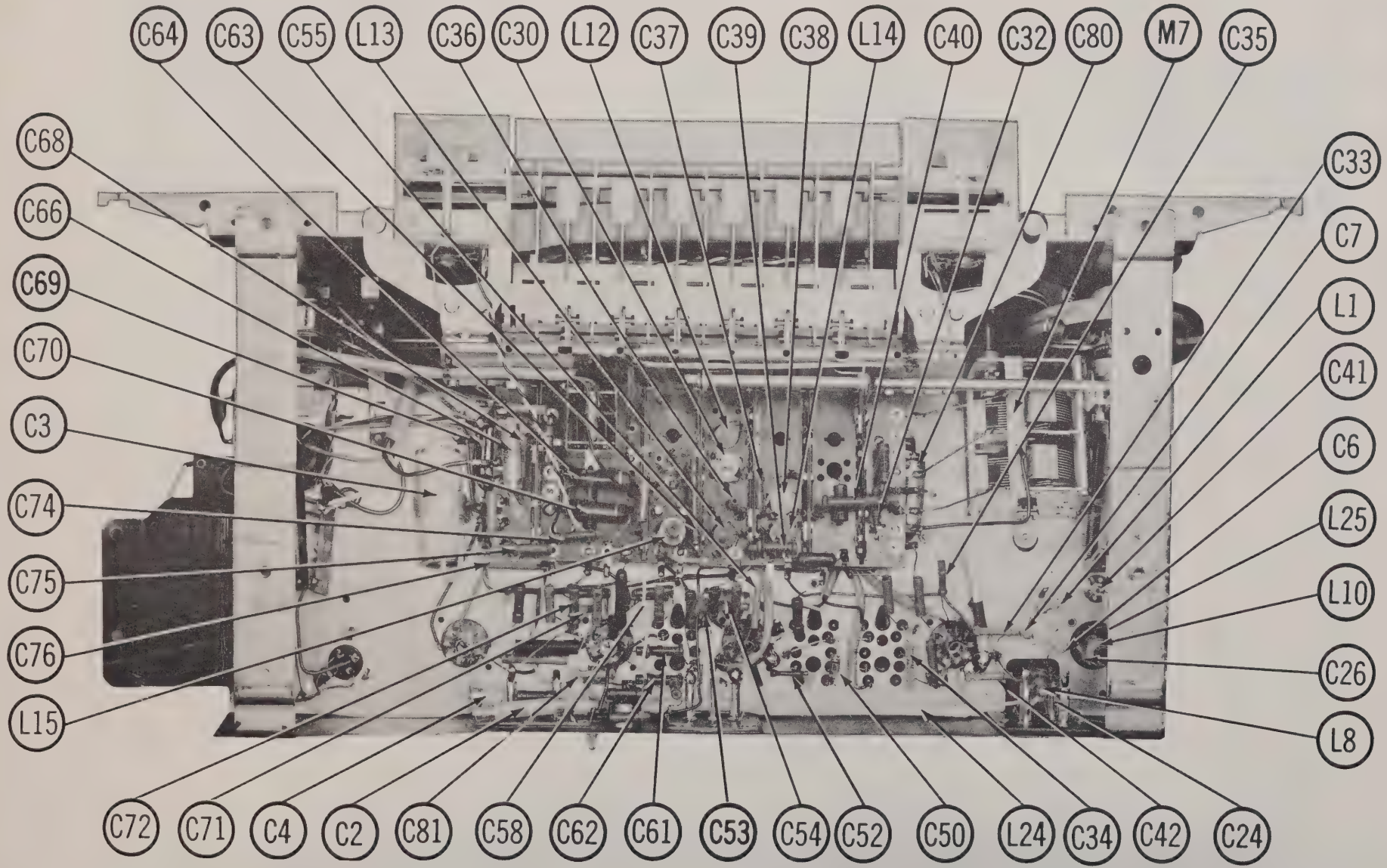
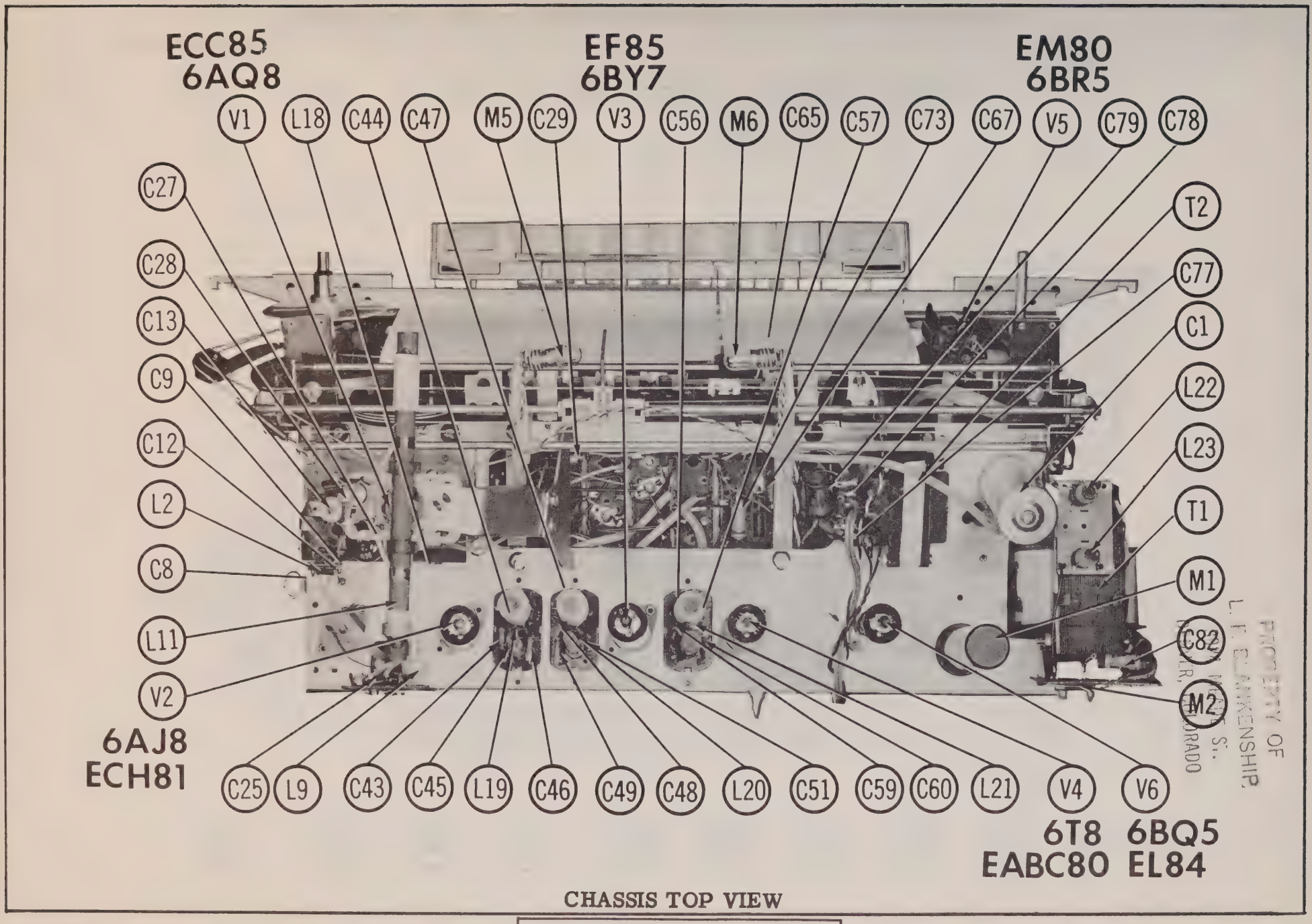


CHASSIS BOTTOM VIEW — CAPACITOR, INDUCTOR & MISC. IDENTIFICATION



CHASSIS TOP VIEW

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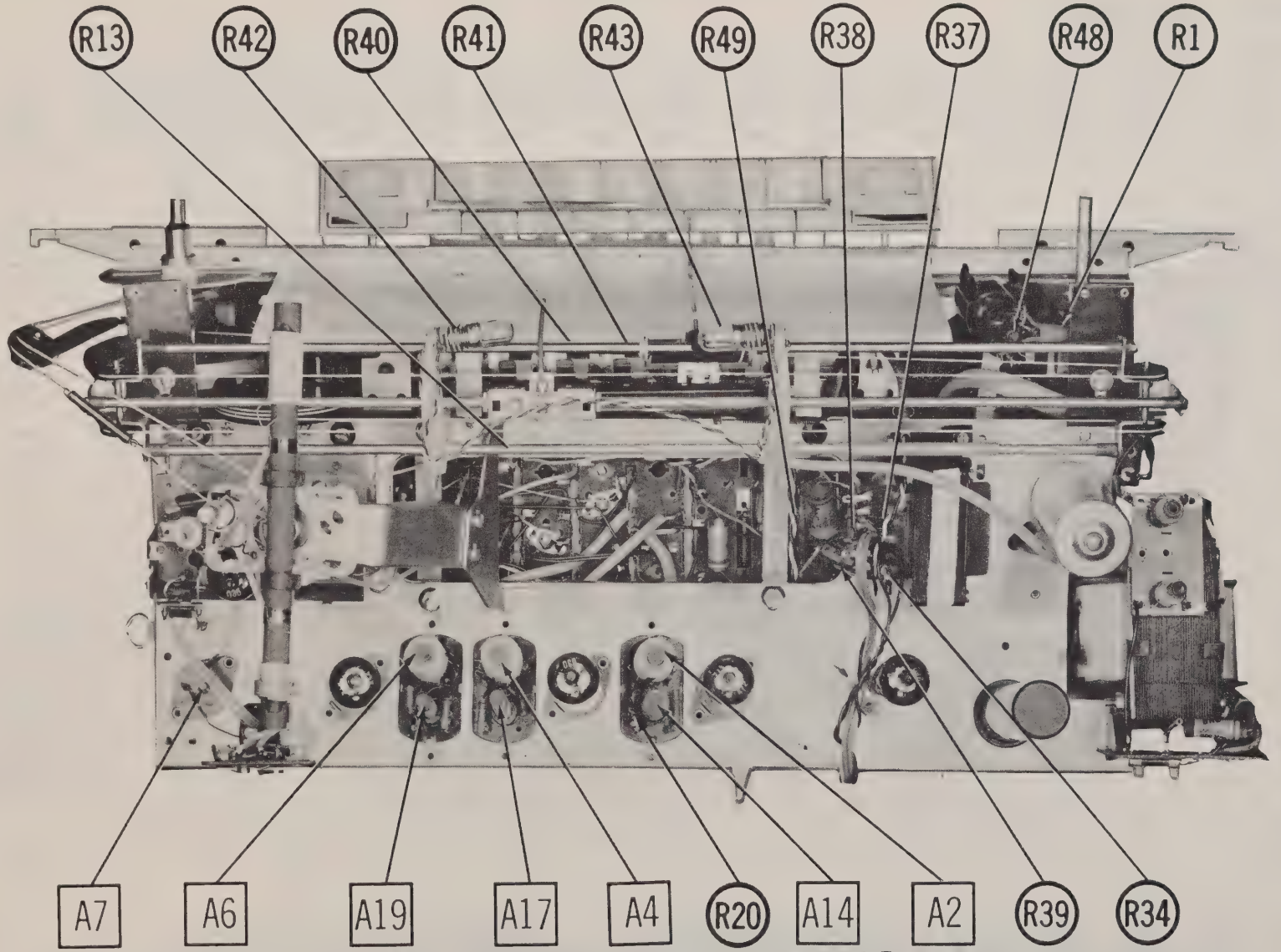
OLYMPIC
MODEL "METEOR" 5781W

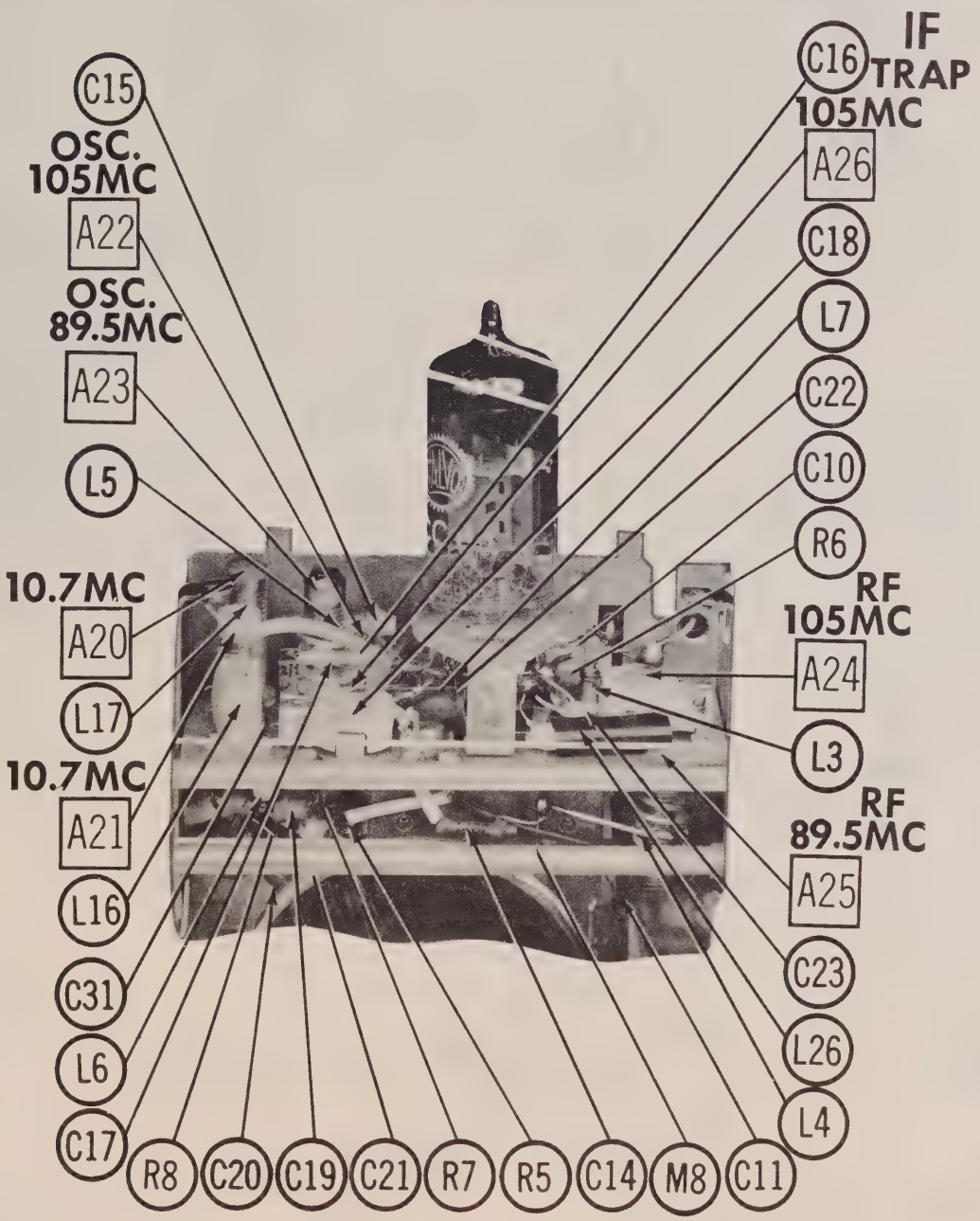
FOLDER 9

PAGE 3

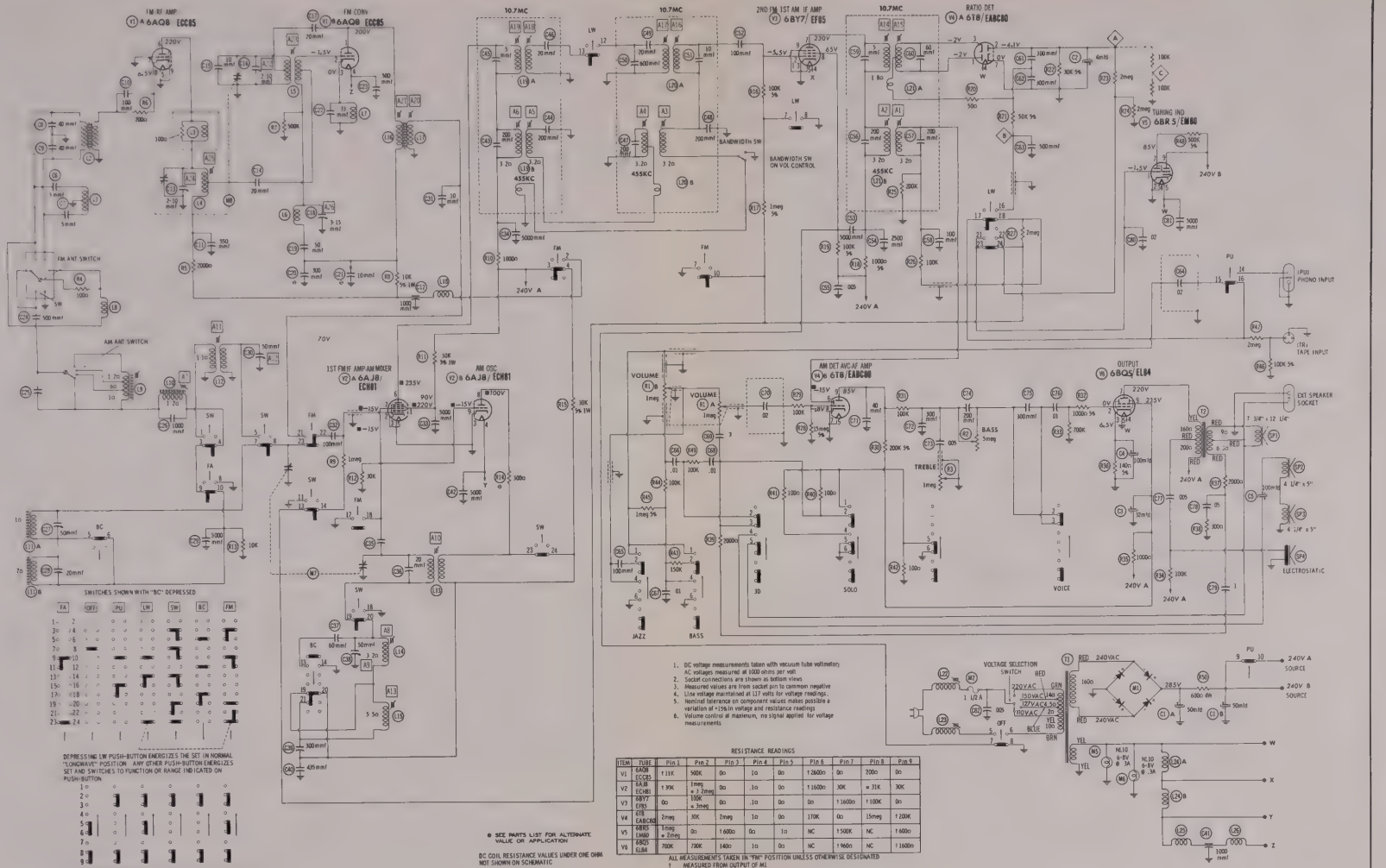


CHASSIS TOP VIEW — ALIGNMENT & RESISTOR IDENTIFICATION

PROPERTY OF
L. F. BLANKENSHIP
3921 MEADE ST.
DENVER, COLORADO



CHASSIS — RF SUB ASSEMBLY


FM RF AMP
V1 A 6AQ8 ECC85
FM CONV
V2 B 6AQ8 ECC85
10.7MC
2ND FM 1ST AM IF AMP
V3 6BY7/ EF85
RATIO DET
V4 A 6T8/EABC80
TUNING IND
V5 6BR5/EM80
FM ANT SWITCH
AM ANT SWITCH
1ST FM/IF AMP AM MIXER
V7 A 6AJ8/ ECH81
AM OSC
V7 B 6AJ8/ ECH81
AM DET AVC AF AMP
V6 6T8/EABC80
OUTPUT
V8 6BQ5/EL84
455KC
BANDWIDTH SW
BANDWIDTH SW ON VOL CONTROL
VOLUME
BASS
TREBLE
JAZZ
SOLO
VOICE
3D
PU
PHONO INPUT
TAPE INPUT
EXT SPEAKER SOCKET
ELECTROSTATIC
240V A
240V B
SWITCHES SHOWN WITH "BC" DEPRESSED
FA OFF PU LW SW BC FM
DEPRESSING LW PUSH-BUTTON ENERGIZES THE SET IN NORMAL "LONGWAVE" POSITION. ANY OTHER PUSH-BUTTON ENERGIZES SET AND SWITCHES TO FUNCTION OR RANGE INDICATED ON PUSH-BUTTON
ORCH VOICE SOLO JAZZ BASS 3D
ALL SWITCHES SHOWN IN THE "OUT" POSITION.
VOLTAGE SELECTION SWITCH
220VAC GRN
150VAC
125VAC
110VAC
OFF
BLK
BRN
RED
YEL
WHT
NC.10 6-8V @ 5A
NC.10 6-8V @ 3A
1. DC voltage measurements taken with vacuum tube voltmeter.
AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.
RESISTANCE READINGS
ITEM TUBE Pin 1 Pin 2 Pin 3 Pin 4 Pin 5 Pin 6 Pin 7 Pin 8 Pin 9
V1 6AQ8 ECC85 ↑11K 500K 0Ω 1Ω 0Ω ↑260Ω 0Ω 200Ω 0Ω
V2 6AJ8 ECH81 ↑ 9K 1meg ± 3 2meg 0Ω 1Ω 0Ω ↑160Ω 30K ∞ 31K 30K
V3 6BY7 EF85 0Ω 100K ± 3meg 0Ω 1Ω 0Ω 0Ω ↑160Ω ↑100K 0Ω
V4 6T8 EABC80 1meg ± 2meg 30K 2meg 1Ω 0Ω 170K 0Ω 15meg ↑200K
V5 6BR5 EM80 1meg ± 2meg 0Ω ↑600Ω 0Ω 1Ω NC ↑500K NC ↑600Ω
V6 6BQ5 EL84 700K 700K 140Ω 1Ω 0Ω NC ↑960Ω NC ↑1600Ω
ALL MEASUREMENTS TAKEN IN "FM" POSITION UNLESS OTHERWISE DESIGNATED
↑ MEASURED FROM OUTPUT OF M1
= MEASURED IN "AM" POSITION
NC NO CONNECTION
⊕ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION
DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC
392-9

A PHOTOFACT STANDARD NOTATION SCHEMATIC

Howard W. Sams & Co., Inc. 1958

ALIGNMENT INSTRUCTIONS

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

To set pointer, turn tuning capacitor fully closed and set pointer to last reference mark at low frequency end of dial.
Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading.
Use an insulated alignment screwdriver for adjusting.

AM ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.05mfd	High side to pin 2 (grid) of 6AJ8/ECH81 (V2). Low side to chassis.	455KC (400∿ Mod.)	BC	Tuning gang fully open	Across voice coil	A1, A2, A3, A4 A5, A6	Adjust for maximum output.
2.	"	Thru dummy to short wave antenna terminals	"	"	"	"	A7	Adjust for MINIMUM output.
3.		Loop	1500KC	"	1500KC	"	A8	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
4.		"	550KC	"	550KC	"	A9	"
5.	500mmf	Thru dummy to short wave antenna terminals	6MC	SW	6MC	"	A10, A11	Adjust for maximum output.
6.	"	"	15MC	"	15MC	"	A12	"
7.	"	"	200KC	LW	200KC	"	A13	"

FM IF ALIGNMENT USING AM SIGNAL GENERATOR & VTVM

Connect two matched 100K (±1%) resistors in series from point Ⓐ to chassis. The junction of these two resistors is alignment point Ⓒ as shown on the schematic.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
8.	.005mfd	High side to pin 2 (grid) of 6BY7/EF85 (V3). Low side to chassis.	10.7MC (10MC Swp)	FM	Tuning gang fully closed	DC probe to point Ⓐ. Common to chassis.	A14	Adjust for maximum deflection.
9.	"	"	"	"	"	DC probe to point Ⓑ. Common to point Ⓒ.	A15	Adjust for zero reading. A positive and negative reading will be obtained on either side of the correct setting.
10.	200mmf	High side to pin 2 (grid) of 6AQ8/ECC85 (V1). Low side to chassis.	"	"	"	DC probe to point Ⓐ. Common to chassis.	A16, A17, A18, A19, A20, A21	Adjust for maximum deflection.

FM IF ALIGNMENT USING FM SIGNAL GENERATOR & OSCILLOSCOPE

Use frequency modulated signal with 60∿ modulation and 450KC sweep. Use 120∿ sawtooth voltage in scope for horizontal deflection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT SCOPE	ADJUST	REMARKS
8.	.005mfd	High side to pin 2 (grid) of 6AQ8/ECC85 (V1). Low side to chassis.	10.7MC (450KC Swp)	FM	Tuning gang fully closed	Vert. Amp. to point Ⓐ. Low side to chassis.	A14, A16, A17, A18, A19, A20, A21	Disconnect stabilizer capacitor C2. Adjust for maximum amplitude and symmetry similar to Fig. 1.
9.	"	"	"	"	"	Vert. Amp. to point Ⓑ. Low side to chassis.	A15	Reconnect capacitor C2. Adjust A15 so that 10.7MC marker occurs at center of crossover lines similar to Fig. 2. SLIGHTLY retouch A14 for maximum amplitude and straightness of crossover lines.

FM RF ALIGNMENT

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	BAND SWITCH POS.	RADIO DIAL SETTING	CONNECT VTVM	ADJUST	REMARKS
10.	300Ω Carbon Resistor	Across FM antenna terminals	105MC (Unmod.)	FM	105MC	DC probe to point Ⓐ. Common to chassis.	A22	Adjust for maximum deflection.
11.	"	"	89.5MC	"	89.5MC	"	A23	"
12.	"	"	105MC	"	105MC	"	A24	"
13.	"	"	89.5MC	"	89.5MC	"	A25	"
14.	"	"	105MC	"	105MC	"	A26	Adjust for MINIMUM deflection.

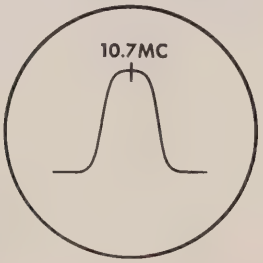


FIG. 1

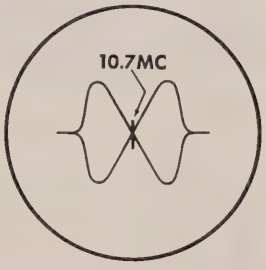
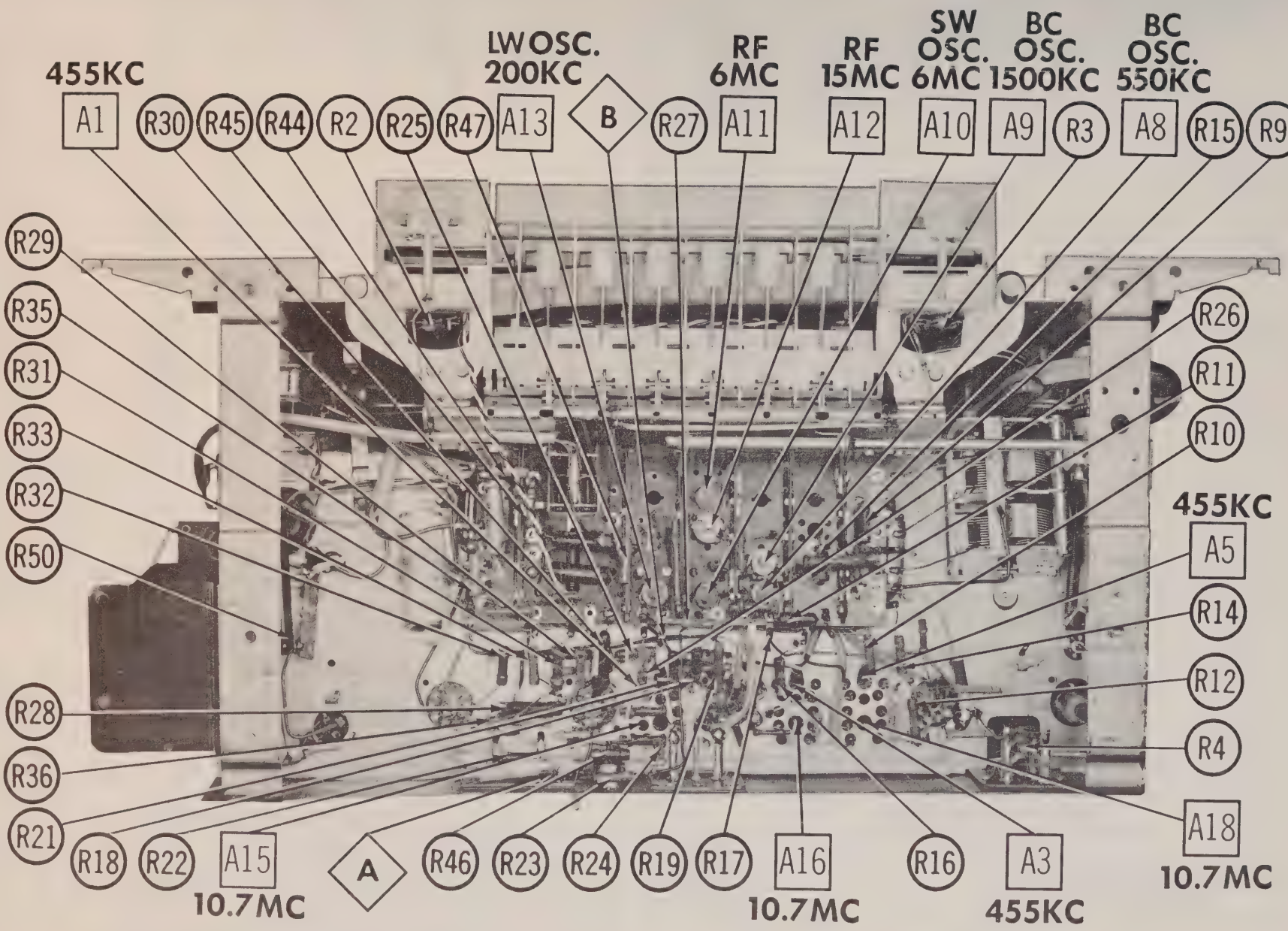


FIG. 2



CHASSIS BOTTOM VIEW — ALIGNMENT & RESISTOR IDENTIFICATION

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE
V1	FM RF Amp. - FM Conv.	6AQ8/ECC85
V2	1st FM IF Amp. - AM Mixer -AM Oscillator	6AJ8/ECH81
V3	2nd FM IF Amp. - 1st AM IF Amp.	6BY7/EF85
V4	Ratio Det. - AM Det. - AVC -AF Amplifier	6T8/EABC80
V5	Tuning Indicator	6BR5/EM80
V6	Output	6BQ5/EL84

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	OLYMPIC PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	50	385		PR4-200	BBRQ0174		CDB-Q-422	D-190	TVA-4750
B	50	385							
C2	4	80		PRS150V4	BBR4-150	TC40	TD-4-150	MT-1504	TVA-1402
C3	32	385		PRS450V30	BR3045	TC77	TD-30-450	MT-4530	TVA-1712
C4	100	15		PRS15V100	BBR100-15	TC2501	TD-100-15	MTH-1510	TVA-1160
C5	100	35		PRS50V100	BR1005	TC3501	TD-100-50	MTH-5010	TVA-1310

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	OLYMPIC PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C6	5			NPO-SI 5	TCZ4R7	C10V5C	TCO-5	ZT-555	5TCCB-V47	
C7	5			NPO-SI 5	TCZ4R7	C10V5C	TCO-5	ZT-555	5TCCB-V47	
C8	40									
C9	40									
C10	100			SI 100	D6-101	LT6T1	GP-100	UC-531	5GA-T1	
C11	550									
C12	1000		C0G25038	EF-001	MFT-1000				503C-D1	
C13	2-10									
C14	20									
C15	10									
C16	2-10									
C17	20									
C18	3-15									
C19	50									
C20	300			SI 300	D6-301	LT6T3	GP-300	UC-533	5GA-T3	①
C21	10			BPD-00001	D6-100	L10Q1	GP-10	UC-541	5GA-Q1	②
C22	33			SI 33	D6-330	LT6Q33	GP-33	UC-5433	5GA-Q33	
C23	500			BPD-0005	DD-501	L10T5	ED-500	UC-535	5GA-T5	
C24	500			SI 500	D6-501	LT6T5	GP-500	UC-535	5GA-T5	
C25	200			SI 200	D6-201	LT6T2	GP-200	UC-532	5GA-T2	
C26	1000			SI 1000	D6-102	LT6D1	GP-1000	UC-521	5GA-D1	
C27	50									
C28	20			SI 20	D6-200	LT6Q2	GP-20	UC-542	5GA-Q2	
C29	5000			SI 5000	D6-502	LT6D5	GP-5000	UC-525	5GA-D5	
C30	50									
C31	10			SI 10	D6-100	LT6Q1	GP-10	UC-541	5GA-Q1	
C32	100			SI 100	D6-101	LT6T1	GP-100	UC-531	5GA-T1	
C33	5000			SI 5000	D6-502	LT6D5	GP-5000	UC-525	5GA-D5	
C34	5000			SI 5000	D6-502	LT6D5	GP-5000	UC-525	5GA-D5	
C35	50									
C36	20									
C37	60									
C38	50									
C39	300									
C40	435									
C41	1000		C0G25038	EF-001	MFT-1000				503C-D1	
C42	5000			SI 5000	D6-502	LT6D5	GP-5000	UC-525	5GA-D5	
C43	200			SI 200	D6-201	LT6T2	GP-200	UC-532	5GA-T2	
C44	200			SI 200	D6-201	LT6T2	GP-200	UC-532	5GA-T2	
C45	5			DI-000005	DD-050	L10V5	ED-5	ZT-555	5GA-V5	
C46	20			SI 20	D6-200	LT6Q2	GP-20	UC-542	5GA-Q2	
C47	200			SI 200	D6-201	LT6T2	GP-200	UC-532	5GA-T2	
C48	200			SI 200	D6-201	LT6T2	GP-200	UC-532	5GA-T2	
C49	20			SI 20	D6-200	LT6Q2	GP-20	UC-542	5GA-Q2	
C50	600									
C51	10			SI 10	D6-100	LT6Q1	GP-10	UC-541	5GA-Q1	

PARTS LIST AND DESCRIPTIONS (Continued)

RESISTORS (cont)

ITEM No.	RATING		OLYMPIC PART No.	NOTES
	OHMS	WATT		
R44	100K			
R45	1meg 5%			
R46	100K 5%			
R47	2meg			

ITEM No.	RATING		OLYMPIC PART No.	NOTES
	OHMS	WATT		
R48	500K 5%			
R49	100K			
R50	600Ω	4		

Note 1. Some versions may use 100Ω in this application.

TRANSFORMER (POWER)

ITEM No.	RATING				REPLACEMENT DATA					
	PRI.	SEC. 1	SEC. 2	SEC. 3	OLYMPIC PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	220V Tap @ 150V, 127V & 110V @ .56A	240V @ .082A	6.3V @ 3A		TRG25029 (NTR-11A)					

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	OLYMPIC PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T2	4500Ω CT	3-4Ω	TRG25030 (ATR-31)						

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	OLYMPIC PART No.	QUAM PART No.	
SP1	7 3/4" X 12 1/4"	PM	3-4Ω	SKG25031		
SP2	4 1/4" X 5"	PM	6-8Ω	SKG25071		
SP3	4 1/4" X 5"	PM	6-8Ω	SKG25071		
SP4	Electrostatic			SKG25033		

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		OLYMPIC PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	FM Ant. Coil					
L2	FM Ant. Trans.					
L3	RF Choke					Wound on 100Ω resistor
L4	FM RF Coil					
L5	FM Osc. Coil					
L6	FM Mixer					
L7	Cathode Choke					
L8	Ant. Trap Coil					
L9	AM Ant. Coil					
L10	Ant. Trap Coil					
L11A	Loop Stick	LPG25023				
B	Loop Stick					
L12	AM RF Coil					
L13	SW Osc. Coil					
L14	BC Osc. Coil					
L15	LW Osc. Coil					
L16	1st FM IF Pri.					
L17	1st FM IF Sec.					
L18	RF Choke					3.5 Microhenries
L19A	2nd FM IF	TRG25020				
B	1st AM IF					
L20A	3rd FM IF	TRG25021				
B	2nd AM IF					
L21A	FM Ratio Det.	TRG25022				
B	3rd AM IF					
L22	Line choke					
L23	Line choke					
L24A	Fil. choke					
B	Fil. choke					
L25	Fil. choke				4606	2.9 Microhenries
L26	Fil. choke					1.8 Microhenries

PARTS LIST AND DESCRIPTIONS (Continued)

CAPACITORS (cont)

ITEM No.	RATING CAP.	RATING VOLT	REPLACEMENT DATA OLYMPIC PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C52	100			SI 100	D6-101	LT6T1	GP-100	UC-531	5GA-T1	
C53	5000			SI 5000	D6-502	LT6D5	GP-5000	UC-525	5GA-D5	
C54	2500			SI 2500	D6-252	LT6D25	GP-2500	UC-5225	5GA-D25	
C55	.005	125		P288N-005	D6-502	LT6D5	GP-5000	UC-525	5GA-D5	
C56	200			SI 200	D6-201	LT6T2	GP-200	UC-532	5GA-T2	
C57	200			SI 200	D6-201	LT6T2	GP-200	UC-532	5GA-T2	
C58	100			SI 100	D6-101	LT6T1	GP-100	UC-531	5GA-T1	
C59	5			SI 5	D6-050	L10V5	ED-5	ZT-555	5GA-V5	
C60	60									
C61	300			SI 300	D6-301	LT6T3	GP-300	UC-533	5GA-T3	
C62	300			SI 300	D6-301	LT6T3	GP-300	UC-533	5GA-T3	
C63	500			SI 500	D6-501	LT6T5	GP-500	UC-535	5GA-T5	
C64	.02	250		P488N-02	DD-203	LT6S2	ED-02	GEM-412	5GA-S2	
C65	100			SI 100	D6-101	LT6T1	GP-100	UC-531	5GA-T1	
C66	.01	125		P288N-01	D6-103	LT6S1	GP-10000	GEM-411	5GA-S1	
C67	.01	125		P288N-01	D6-103	LT6S1	GP-10000	GEM-411	5GA-S1	
C68	.01	125		P288N-01	D6-103	LT6S1	GP-10000	GEM-411	5GA-S1	
C69	.3	125								
C70	.02	250		P488N-02	DD-203	LT6S2	ED-02	GEM-412	4TM-S2	
C71	40				D6-400					
C72	300			SI 300	D6-301	LT6T3	GP-300	UC-533	5GA-T3	
C73	.005	250		P488N-005	D6-502	LT6D5	GP-5000	UC-525	5GA-D5	
C74	200			SI 200	D6-201	LT6T2	GP-200	UC-532	5GA-T2	
C75	300			SI 300	D6-301	LT6T3	GP-300	UC-533	5GA-T3	
C76	.01	250		P488N-01	D6-103	LT6S1	GP-10000	GEM-411	5GA-S1	
C77	.005	250		P488N-005	D6-502	LT6D5	GP-5000	UC-525	5GA-D5	
C78	.05	250		P488N-05	DF-503	CUB4S5		GEM-415	4TM-S5	
C79	.1	250		P488N-1	DF-104	CUB4P1		GEM-401	4TM-P1	
C80	.02	250		P488N-02	DD-203	LT6S2	ED-02	GEM-412	4TM-S2	
C81	5000			SI 5000	D6-502	LT6D5	GP-5000	UC-525	5GA-D5	
C82	.005	250		P488N-005	D6-502	LT6D5	GP-5000	UC-525	5GA-D5	

① Some versions use 350mmf in this application.
② Not used in some versions.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	REPLACEMENT DATA OLYMPIC PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	1meg	½	PTG25027					Volume
B	1meg	½						Volume
C	Switch							
R2	5meg	½	PTG25026					Bass
R3	1meg	½	PTG25025					Treble

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	OLYMPIC PART No.	NOTES
R4	100Ω			
R5	2000Ω			
R6	200Ω			
R7	500K			
R8	10K 5%	1		
R9	1meg			
R10	1000Ω			
R11	30K 5%	1		
R12	30K			
R13	10K			
R14	300Ω			Note 1
R15	30K 5%	1		
R16	100K 5%			
R17	1meg 5%			
R18	1000Ω 5%			
R19	100K 5%			
R20	50Ω			
R21	50K 5%			
R22	30K 5%			
R23	2meg			

ITEM No.	RATING OHMS	RATING WATT	OLYMPIC PART No.	NOTES
R24	2meg			
R25	200K			
R26	100K			
R27	2meg			
R28	15meg 5%			
R29	100K			
R30	200K 5%			
R31	100K			
R32	1000Ω 5%			
R33	700K			
R34	100K			
R35	1000Ω			
R36	140Ω 5%			
R37	2000Ω			
R38	300Ω			
R39	2000Ω			
R40	100Ω			
R41	100Ω			
R42	100Ω			
R43	150K			

PARTS LIST AND DESCRIPTIONS (Continued)

RECTIFIERS

ITEM No.	RATING CURRENT (Measured)	REPLACEMENT DATA OLYMPIC PART No.	FEDERAL PART No.	INTERNATIONAL PART No.	SARKES TARZIAN PART No.	NOTES
M1	.082A	RFG25034		60-9150 ①		① 2 Required.

FUSES

ITEM No.	TYPE	RATING	REPLACEMENT DATA OLYMPIC PART No. FUSE	OLYMPIC PART No. HOLDER	LITTELFUSE PART No. FUSE	LITTELFUSE PART No. HOLDER	BUSS PART No. FUSE	BUSS PART No. HOLDER
M2		1½A	FUG25037					

PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA OLYMPIC PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. MOUNT	REMARKS
M3						

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA OLYMPIC PART No.	JENSEN PART No.	WALCO PART No.	REMARKS
M4		†♦ RX551SD or ♦ RX551D		† Jewel ♦ Diamond

MISCELLANEOUS

ITEM No.	PART NAME	OLYMPIC PART No.	NOTES
M5	Dial Light	BUG25035	#NL10 (6-8V . 3A)
M6	Dial Light	BUG25035	#NL10 (6-8V . 3A)
M7	AM Tuning Cap	CVG25028	(SK249) 2 Gang (Ant. 10-450mmf, Osc. 10-450mmf)
M8	FM Tuning Assy.	CVG25018	Complete
	Piano Keyboard	PBG25040	Complete Assembly, Model Moderna 5783W
	Piano Keyboard	PBG25019	Complete Assembly, Model Meteor 5781W

CABINETS & CABINET PARTS

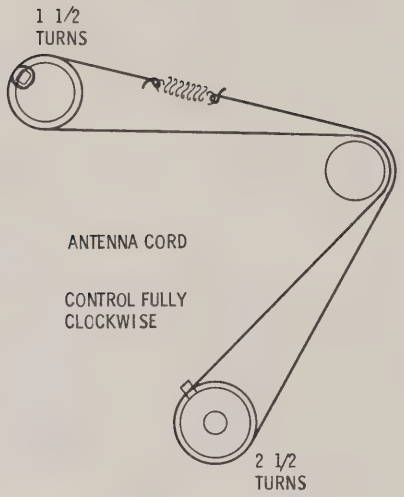
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

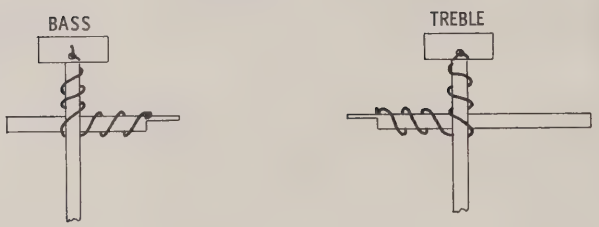
NAME	PART NO.	DESCRIPTION
Knob	KNG25042-1	Bass, Treble (Ivory) Moderna
Knob	KNG25043-1	Volume, Tuning (Ivory) Moderna
Knob	KNG25044-1	Antenna Tuning (Ivory) Moderna
Knob	KNG25042	Bass, Treble (Brown) Meteor
Knob	KNG25043	Volume, Tuning (Brown) Meteor
Knob	KNG25044	Antenna Tuning (Brown) Meteor
Cabinet	CAG25093	Moderna
Cabinet	CAG25039	Meteor
Dial Scale	DLG25104	Moderna
Dial Scale	DLG25024	Meteor

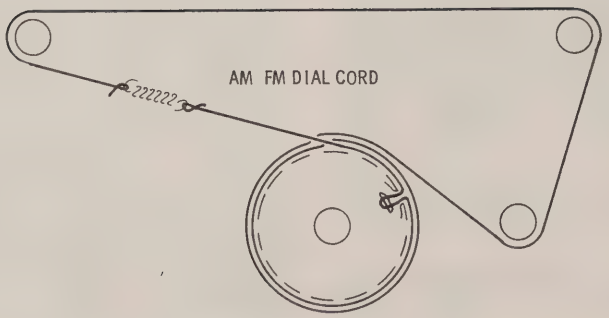
WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)







TUNING GANG FULLY CLOSED.

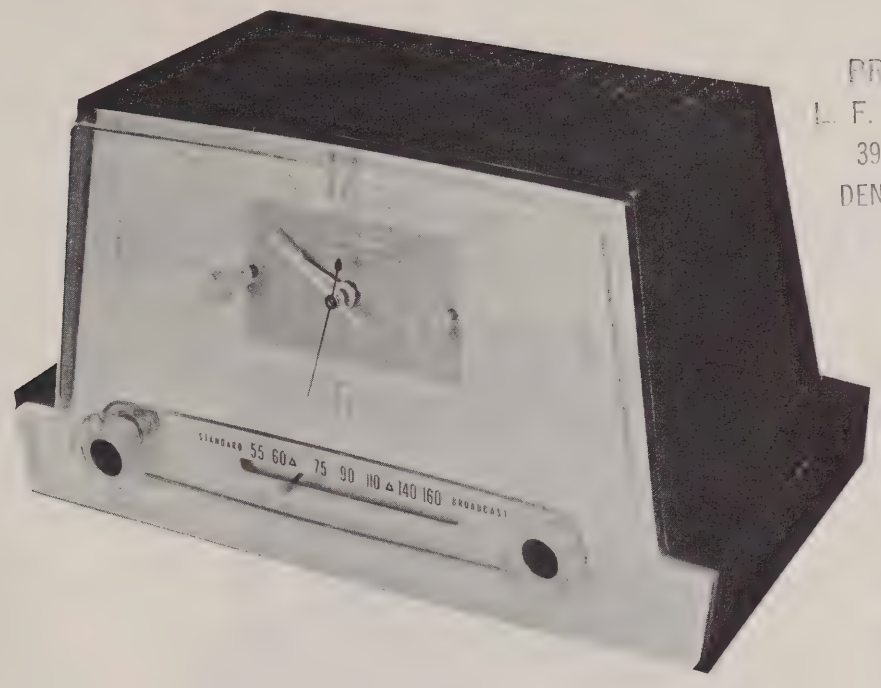
DIAL CORD STRINGING

PHOTOFACT* Folder
*TRADE MARK

SILVERTONE MODELS 8021, 8022, 8023 (Ch. 528.53040)

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

SILVERTONE MODELS 8021, 8022, 8023 (Ch. 528.53040)



SILVERTONE MODELS 8021, 8022, 8023 (Ch. 528.53040)

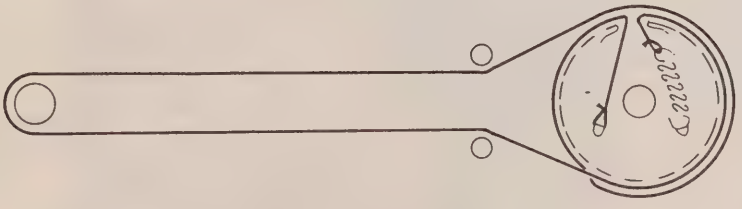
TRADE NAME	Silvertone Models 8021, 8022, 8023 (Ch. 528.53040)
SUPPLIER	Sears, Roebuck & Co., 925 S. Homan Ave., Chicago, Illinois
TYPE SET	AC Operated AM Receiver With Electric Clock
TUBES (Five)	Types 12BE6 Converter, 12BA6 IF Amplifier, 12AV6 Det. - AVC - AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles
RATING	.28 Amp. @ 117 Volts AC (28 Watts Without Clock)
TUNING RANGE—BROADCAST	535 - 1630KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1mfd capacitor in series with low side of signal generator and B-. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.1mfd	High side to pin 7 (grid) of 12BE6 (V1). Low side to chassis.	455KC (400∿ Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.		Loop	1630KC	"	"	A5	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.
3.		"	1400KC	1400KC	"	A6	Adjust for maximum output.

TUNING GANG FULLY CLOSED



DIAL CORD STRINGING

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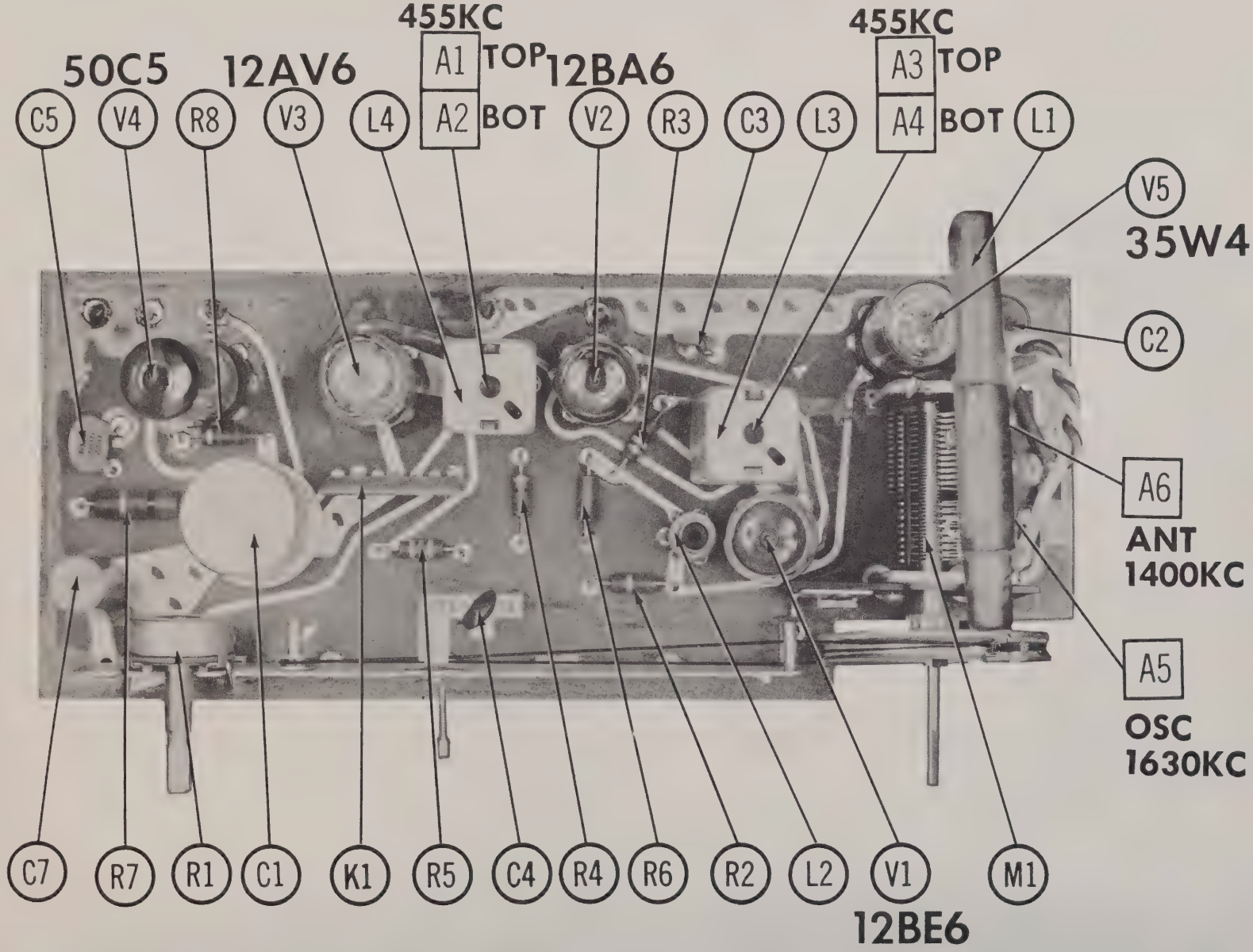
H340

FOLDER 10



CHASSIS-TOP VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	12BE6	
V2	IF Amplifier	12BA6	
V3	Det. - AVC - AF Amp.	12AV6	
V4	Output	50C5	
V5	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	SILVERTONE PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■50	150	18-49-5	AFH2-15-05	BBRD5315	FP213.1	TDLD-8	MTD-301	TVA-2450
B	▲30	150							

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	SILVERTONE PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C2	.047	200	20-47-1	P288N-047		BC2S47J		ACE6147	2SE-S47	
C3	1000		15-10217	BPD-001	DD-102	BYA6D1	ED-1000	DC521	5HK-D1	
C4	100		15-10116	BPD-0001	DD-101	L10T1	ED-100	UC-531	5GA-T1	①
C5	5000		15-50217	BPD-005	DD-502	BYA10D5	ED-005	DC525	5HK-D5	
C6	.047	400	20-447-1	P488N-047	DF-503	CUB4S47		GEM-4147	4TM-S47	
C7	.047	400	20-44-1	P488N-047		BC6S47J		ACE6147	4SE-S47	

① Not used in some versions.

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	SILVERTONE PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1	1meg	½	24-265-0					Volume

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	SILVERTONE PART No.	NOTES
R2	22K		60-22302	
R3	100K		60-10401	
R4	82Ω		60-82001	Note 1
R5	47K		60-47302	
R6	2.2meg		60-22502	
R7	1000Ω	1	60-10211	
R8	120Ω		60-12101	

Note 1. Some versions use 150Ω in this application (Part #60-15101).

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	SILVERTONE PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T1	2500Ω	3-4Ω	80-8-1			A-3336①	24S50A		① Drill new mounting hole.

PARTS LIST AND DESCRIPTIONS (Continued)

COILS (RF-IF)

ITEM No.	USE	SILVERTONE PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	NOTES
L1	Loop Stick	82-117-0					
L2	Osc. Coil	10-29-4					
L3	Input IF	10-70-2	16-6780	BC-356	13-PC1	RF-4	
	Input IF	10-90-2	16-6780	BC-356	13-PC1	RF-4	Alternate
L4	Output IF	10-70-2	16-6780	BC-357	13-PC2	RF-4	
	Output IF	10-91-2	16-6780	BC-357	13-PC2	RF-4	Alternate

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	SILVERTONE PART No.	QUAM PART No.	NOTES
SP1	4"	PM	3-4Ω	33-266-4 ①	4A07	① Includes T1

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	SILVERTONE PART No.	REPLACEMENT DATA
K1	Audio Coup. Net.	5000mmf, 5000mmf, 220mmf, 250mmf, 10meg, 470K, 470K	13-14-3	

MISCELLANEOUS

ITEM No.	PART NAME	SILVERTONE PART No.	NOTES
M1	Tuning Cap.	19-56-2	2 Gang (Ant. 35-370mmf)
M2	Clock	59-76	

CABINETS & CABINET PARTS

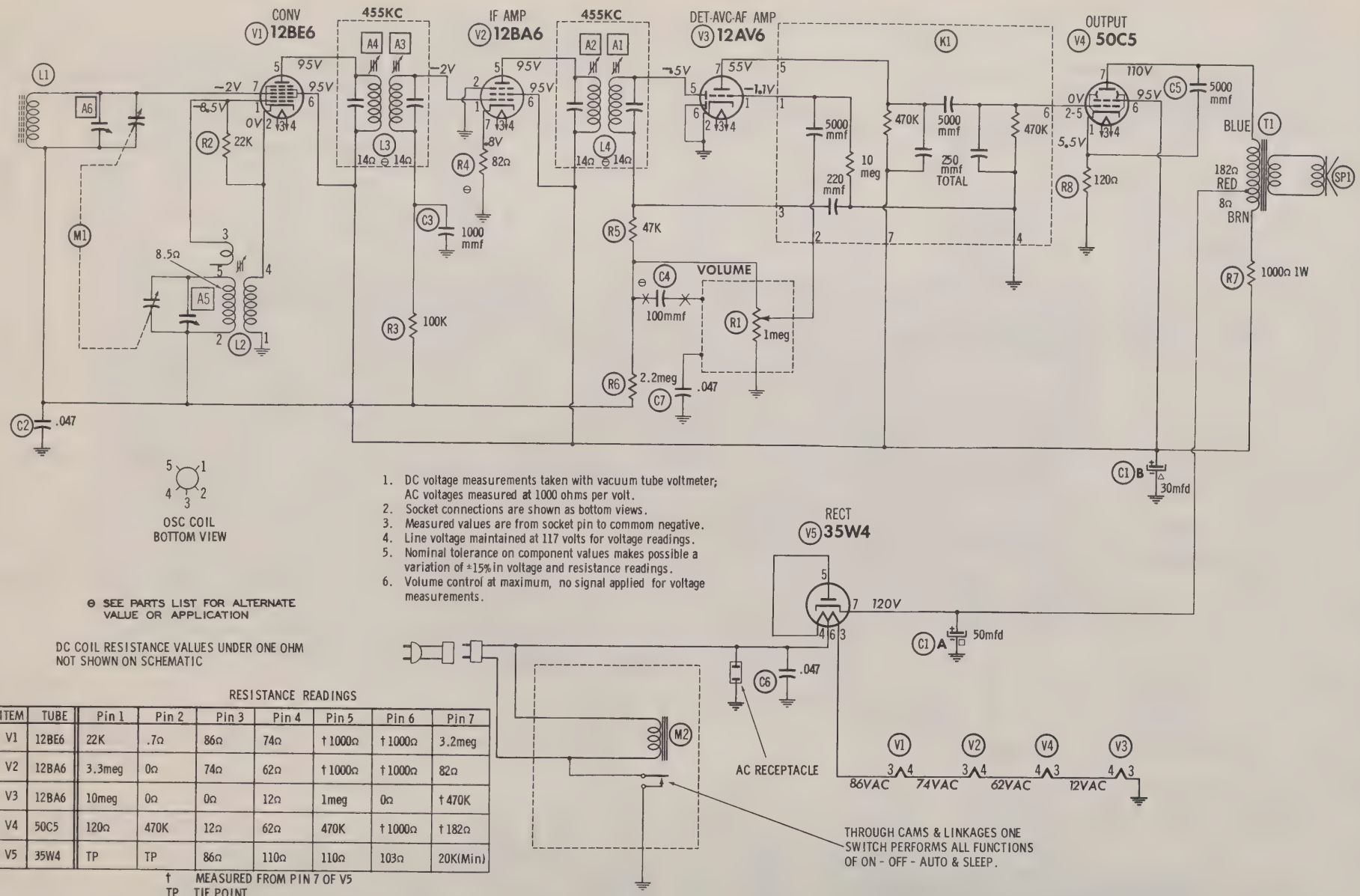
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Escutcheon	40-1-0	Clock Radio
Knob	52-895-0	Sleep, Auto Radio
Knob	52-793-0	Volume
Knob	52-792-0	Tuning
Cabinet	42-15-1	Brown, Model 8021
Cabinet	42-16-1	Ivory, Model 8022
Cabinet	42-17-1	Aqua, Model 8023
Dial Scale	48-137-1	Includes Clock Crystal
Dial Pointer	52-1-1	

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)



OSC COIL
BOTTOM VIEW

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to commom negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

⊖ SEE PARTS LIST FOR ALTERNATE VALUE OR APPLICATION

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC

RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BE6	22K	.7Ω	86Ω	74Ω	†1000Ω	†1000Ω	3.2meg
V2	12BA6	3.3meg	0Ω	74Ω	62Ω	†1000Ω	†1000Ω	82Ω
V3	12BA6	10meg	0Ω	0Ω	12Ω	1meg	0Ω	†470K
V4	50C5	120Ω	470K	12Ω	62Ω	470K	†1000Ω	†182Ω
V5	35W4	TP	TP	86Ω	110Ω	110Ω	103Ω	20K(Min)

† MEASURED FROM PIN 7 OF V5
TP TIE POINT

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

PHOTOFACT* Folder
*TRADE MARK
EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

TRAV-LER MODELS TR-250-A, TR-251-A

PROPERTY OF
L. F. BLANKENSHIP
3924 MEADE ST.
DENVER, COLORADO

TRAV-LER MODELS
TR-250-A, TR-251-A

TRAV-LER MODELS
TR-250-A, TR-251-A

TRADE NAME	Trav-Ler Models TR-250-A, TR-251-A
MANUFACTURER	Trav-Ler Radio & Tel. Corp., 571 W. Jackson Blvd., Chicago, Illinois
TYPE SET	Battery Operated Portable AM Transistorized Receiver
POWER SUPPLY	13.5 Volts DC RATING 13MA @ 13.5 Volts DC
TUNING RANGE—BROADCAST	535KC-1630KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.
IF transformer can mounting lug may be used for ground connection.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01mfd	High side to antenna stator of tuning gang. Low side to ground.	455KC (400~ mod)	Tuning gang fully open	Across voice coil	A1, A2, A3	Adjust for maximum deflection.
2.	"	"	1630KC	"	"	A4	"
3.	"	"	535KC	Tuning gang fully closed.	"	A5	Adjust for maximum deflection. Repeat steps 2 and 3.
4.		Loop	1400KC	Tune to 1400KC signal	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

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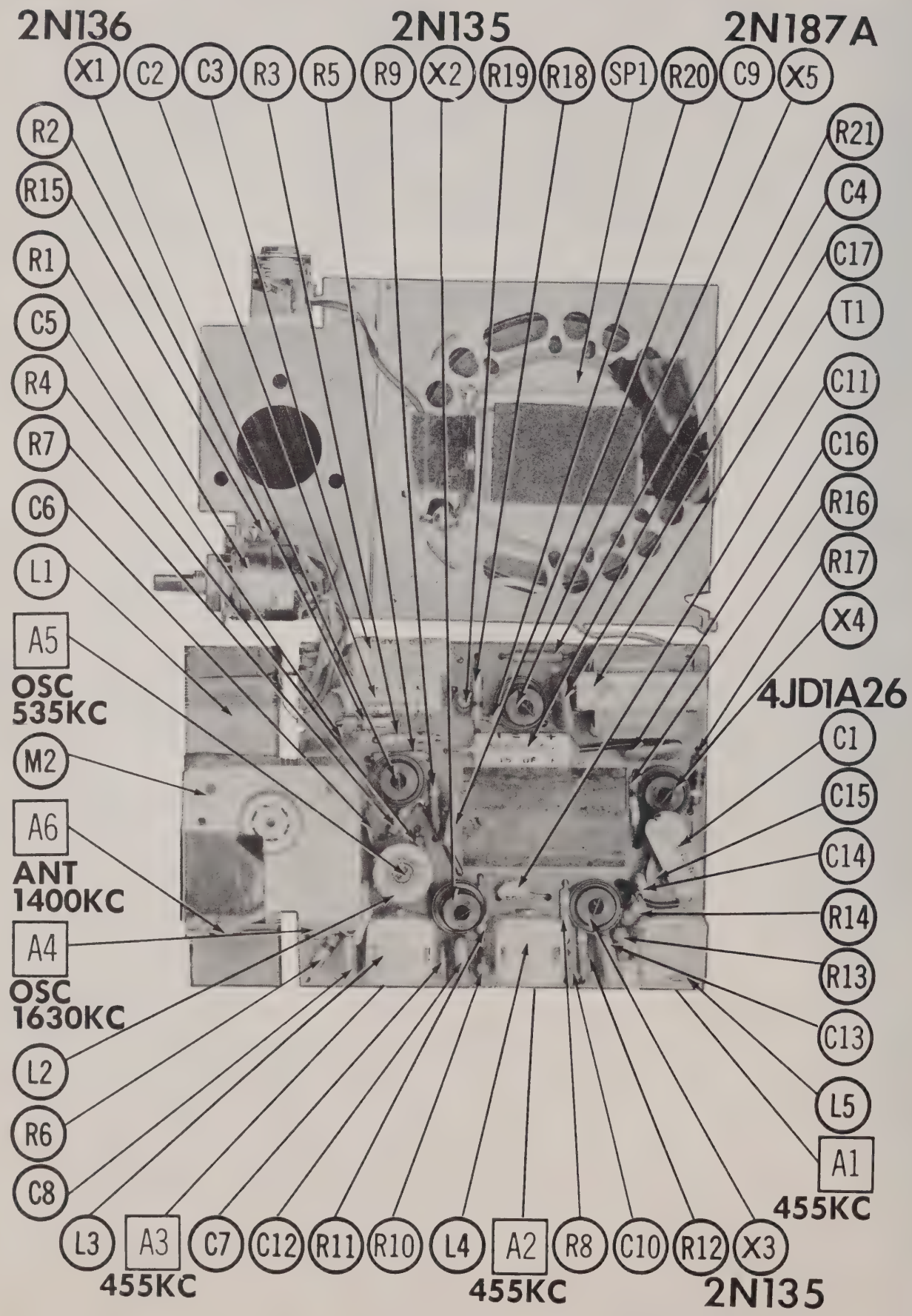


CHASSIS TOP VIEW

PARTS LIST AND DESCRIPTIONS

TRANSISTORS

ITEM No.	ORIG. TYPE	USE	REPLACEMENT DATA			NOTES
			CBS PART No.	RAYTHEON PART No.	SYLVANIA PART No.	
X1	2N136	Converter		2N414		
X2	2N135	1st. IF Amplifier		2N413A		
X3	2N135	2nd. IF Amplifier		2N413A		
X4	4JD1A26	Det.-AVC-AF Amp.	2N180	2N413		
X5	2N187A	Output	2N181	2N360		

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	TRAV-LER PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1	8	25	EC-60	PWE25008	NL10-25	TT25X8	ML8-25		TE-1204
C2	8	25	EC-60	PWE25008	NL10-25	TT25X8	ML8-25		TE-1204
C3	50	3	EC-62	PWE3050	NL50-3	TT6X50	ML50-3		TE-1100
C4	15	12	EC-61	PWE25015	NL15-25	TT25X15			TE-1205

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	TRAV-LER PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C5	20000		CC-65							
C6	10000		CC-64						TG-S10	
C7	10000		CC-64						TG-S10	
C8	50000		CC-66						TG-S50	
C9	100000		CC-63						TG-P10	
C10	10000		CC-64						TG-S10	
C11	33		CC-82							N150 10%
C12	50000		CC-66						TG-S50	
C13	100000		CC-63						TG-P10	
C14	33		CC-82							N150 10%
C15	10000		CC-64						TG-S10	
C16	50000		CC-66						TG-S50	
C17	20000		CC-65							

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	TRAV-LER PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	5000Ω	1/2	VC-88					Volume & switch

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		TRAV-LER PART No.	NOTES
	OHMS	WATT		
R2	10K 5%		IR-179	
R3	68K		IR-181	
R4	68K 5%		IR-176	
R5	2200Ω		IR-175	
R6	10K 5%		IR-179	
R7	47K		IR-182	
R8	8200Ω		IR-177	
R9	2200Ω		IR-175	
R10	10K 5%		IR-179	
R11	39K		IR-178	

ITEM No.	RATING		TRAV-LER PART No.	NOTES
	OHMS	WATT		
R12	2200Ω		IR-175	
R13	330Ω		IR-172	
R14	33K		IR-180	
R15	1000Ω 5%		IR-174	
R16	10K 5%		IR-179	
R17	10Ω		IR-170	
R18	1000Ω 5%		IR-174	
R19	6800Ω 5%		IR-176	
R20	1000Ω 5%		IR-174	
R21	180Ω 5%		IR-171	

PARTS LIST AND DESCRIPTIONS (Continued)

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	TRAV-LER PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	138Ω	22Ω	AT-22				TR-11 ①		① Bend ears down.

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	TRAV-LER PART No.	QUAM PART No.	
SP1	2 3/4"	PM	22Ω	SPK-52		

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA				NOTES
		TRAV-LER PART No.	MEISSNER PART No.	MERIT PART No.	MILLER PART No.	
L1	Loop Stick	LL-46				
L2	Osc. Coil	LO-25				
L3	1st. IF	LI-17			9-C1	
L4	2nd. IF	LI-17			9-C1	
L5	3rd IF	LI-18			9-C2	

BATTERIES

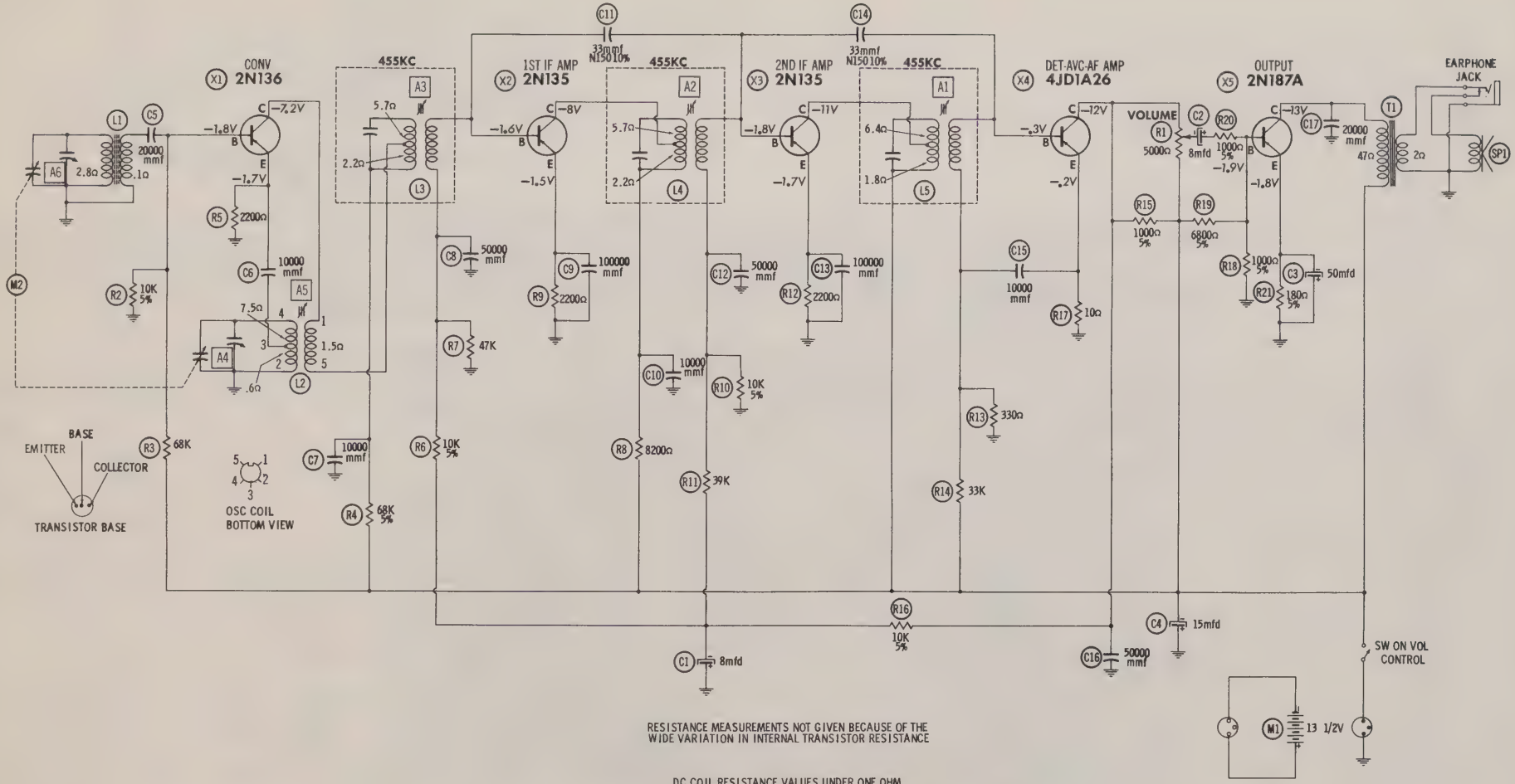
ITEM No.	VOLTAGE	TRAV-LER PART No.	REPLACEMENT DATA								NOTES
			BURGESS		EVEREADY		MALLORY		RAY-O-VAC		
			"A"	"B"	"A"	"B"	"A"	"B"	"A"	"B"	
M1	13½V	BA-2		XX9		239		M-1900		1900	

MISCELLANEOUS

ITEM No.	PART NAME	TRAV-LER PART No.	NOTES
M2	Tuning Cap.	GC-22	2 Gang (Ant. 9-133mmf, Osc. 15-87mmf)

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors



RESISTANCE MEASUREMENTS NOT GIVEN BECAUSE OF THE WIDE VARIATION IN INTERNAL TRANSISTOR RESISTANCE

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC

1. DC voltage measurements taken with vacuum tube voltmeter.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to common negative.
4. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
5. Volume control at maximum. no signal apllied for voltage measurements.

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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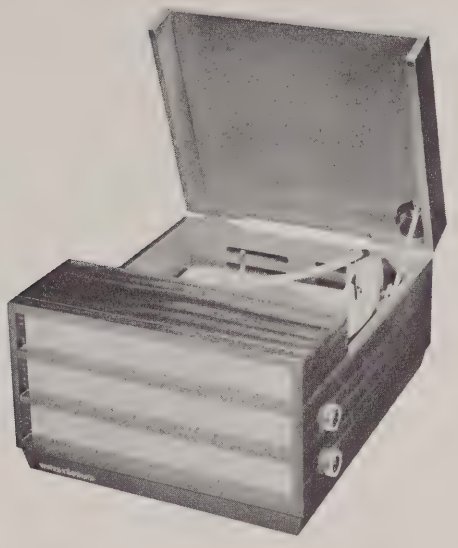
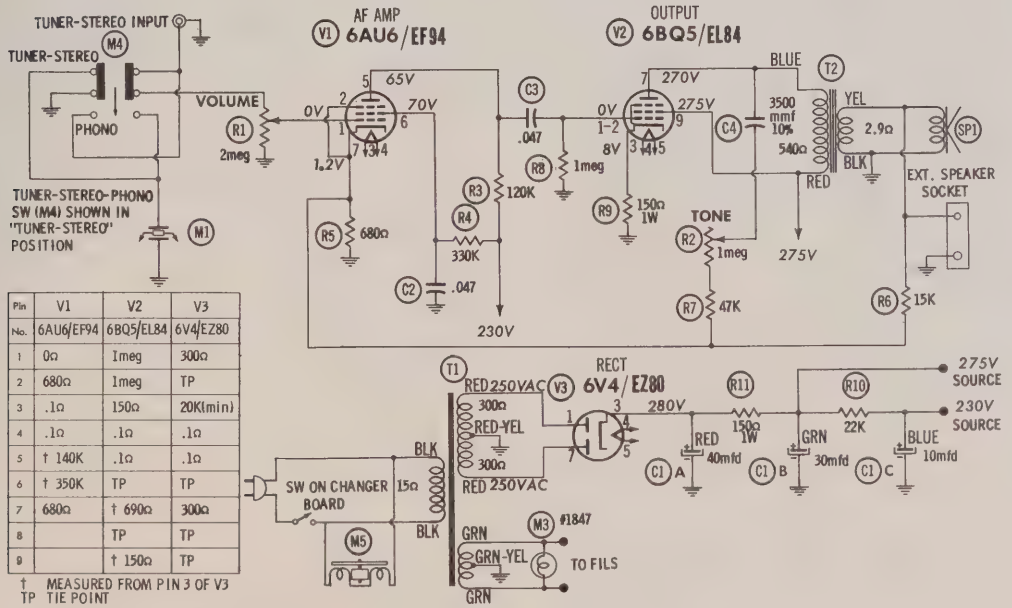
3924 MEADE ST.
DENVER, COLORADO



TRADE NAME	V-M Model 1290
MANUFACTURER	V-M Corp., Benton Harbor, Michigan
TYPE SET	AC Operated Phono Amplifier With 4 Speed Automatic Record Changer
TUBES (Three)	Types 6AU6/EF94 AF Amplifier, 6BQ5/EL84 Output, 6V4/EZ80 Rectifier
POWER SUPPLY	110-120 Volts AC-60 Cycles RATING .29 Amp. @ 117 Volts AC (30 Watts Without Motor)

FOR SERVICE INFORMATION ON RECORD CHANGER V-M MODEL 1210-A-50 — SEE SIMILAR V-M MODEL 1200A— PHOTOFACT SET 353 FOLDER 16



Pin No.	V1 6AU6/EF94	V2 6BQ5/EL84	V3 6V4/EZ80
1	0Ω	1meg	300Ω
2	680Ω	1meg	TP
3	.1Ω	150Ω	20K(min)
4	.1Ω	.1Ω	.1Ω
5	† 140K	.1Ω	.1Ω
6	† 350K	TP	TP
7	680Ω	† 690Ω	300Ω
8		TP	TP
9		† 150Ω	TP

† MEASURED FROM PIN 3 OF V3
TP TIE POINT

A PHOTOFACT STANDARD NOTATION SCHEMATIC
Howard W. Sams & Co., Inc. 1958

392-12

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PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	AF Amplifier	6AU6/EF94	
V2	Output	6BQ5/EL84	

ITEM No.	USE	TYPE	NOTES
V3	Rectifier	6V4/EZ80	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING CAP.	RATING VOLT.	V-M PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	40	300	12086	PR4-175		WQ775		T-100	R2534 *
B	30	300						MTD-4510	
C	10	300							

* Non Catalog Item

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING CAP.	RATING VOLT	V-M PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	NOTES
C2	.047	400	12009	P488N-047	DF-503	CUB4S47		GEM-4147	4TM-S47	
C3	.047	400	12009	P488N-047	DF-503	CUB4S47		GEM-4147	4TM-S47	
C4	3500		12041			1R5D35			MS-235	

CONTROLS

ITEM No.	RATING RESISTANCE	RATING WATTS	V-M PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	INSTALLATION NOTES
R1A	2meg	½	12335	B-76	A47-2meg-Z	Q13-139	TA26A	Volume
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	
R2A	1meg	½	12334	B-70	A47-1meg-Z	Q13-137	TA16A	Tone
B	Shaft			Not Req.	FS-3	Not Req.	Not Req.	

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING OHMS	RATING WATT	V-M PART No.	NOTES
R3	120K		10513	
R4	330K		11333-10	
R5	680Ω		10693-10	
R6	15K		11013-10	
R7	47K		11133-10	

ITEM No.	RATING OHMS	RATING WATT	V-M PART No.	NOTES
R8	1meg		11453	
R9	150Ω	1	10534-10	
R10	22K		11053	
R11	150Ω	1	10534-10	

TRANSFORMER (POWER)

ITEM No.	RATING PRI.	RATING SEC. 1	RATING SEC. 2	RATING SEC. 3	V-M PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.
T1	117V @ .29A	500VCT @ .050A	6.3VCT @ 1.6A		12550					

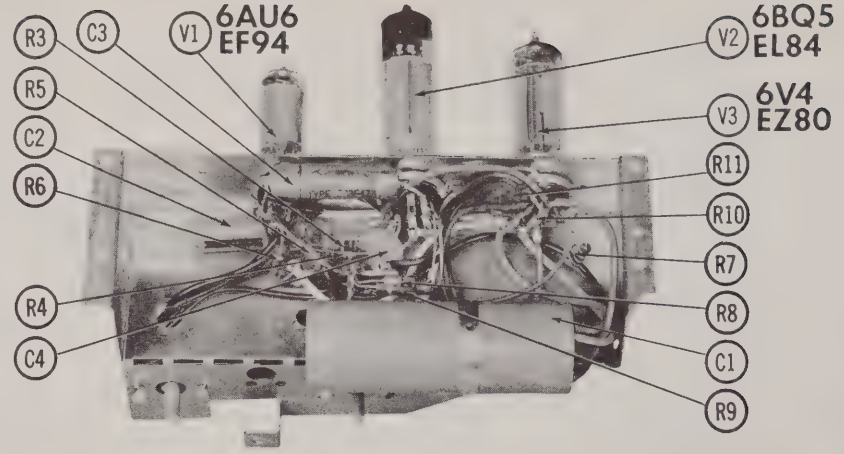
TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE PRI.	IMPEDANCE SEC.	V-M PART No.	Halldorson PART No.	Merit PART No.	Ram PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	NOTES
T2	4000Ω	6-8Ω	12551	Z1106	A-2902 ①	AU-609	A-3337 ①	24S55	S-57Z	① Drill new mounting hole.

SPEAKER

ITEM No.	TYPE SIZE	TYPE FIELD	TYPE V. C. IMP.	V-M PART No.	QUAM PART No.	NOTES
SP1	6" X 9"	PM	6-8Ω	14853	69A3Z8	

CHASSIS—BOTTOM VIEW



PHONO CARTRIDGE

ITEM No.	REPLACEMENT DATA V-M PART No.	ASTATIC PART No. CARTRIDGE	ASTATIC PART No. NEEDLE	ELECTRO-VOICE PART No. CARTRIDGE	ELECTRO-VOICE PART No. MOUNT	REMARKS
M1	7447-A	118-TS	N8-1 & N8-3	56	PT-1	

ASTATIC NEEDLE LISTING SHOWN ABOVE IS SPECIFIED FOR THE RESPECTIVE REPLACEMENT CARTRIDGE LISTED. FOR ORIGINAL CARTRIDGE NEEDLE REPLACEMENTS SEE BELOW.

PHONO NEEDLE

(FOR REPLACEMENT IN ORIGINAL EQUIPMENT CARTRIDGE)

ITEM No.	REPLACEMENT DATA V-M PART No.	JENSEN PART No.	WALCO PART No.	REMARKS
M2	78RPM	† CRA-55 or ♦ CRA-55D	† W64S or ♦ W64D	* Metal † Jewel ♦ Diamond
	L. P.	† CRA-55LP or ♦ CRA-55LPD	† W64MGS or ♦ W64MGD	

MISCELLANEOUS

ITEM No.	PART NAME	V-M PART No.	NOTES
M3	Pilot Lamp	7791	#1847
M4	Switch	9242	Tuner-Stero-Phono (Slide Type DPDT)
M5	Phono Motor	6945	

CABINETS & CABINET PARTS

(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

WIRING DATA

General-use Unshielded Hook-up Wire	Use BELDEN No. 8530 (Solid) Available in Ten Colors 8524 (Stranded) Available in Ten Colors
Power Cord	Use BELDEN No. 1765-B (6 Ft. Length) 1725-K (7½ Ft. Length)
Low-Loss Shielded Lead (Interconnecting)	Use BELDEN No. 8401
Phono Pick-up Arm Cable	Use BELDEN No. 8430 (Two Conductor - Twisted)

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WESTINGHOUSE MODELS H-580T5, H-581T5, H-583T5 (Ch. V-2259-3)

PROPERTY OF
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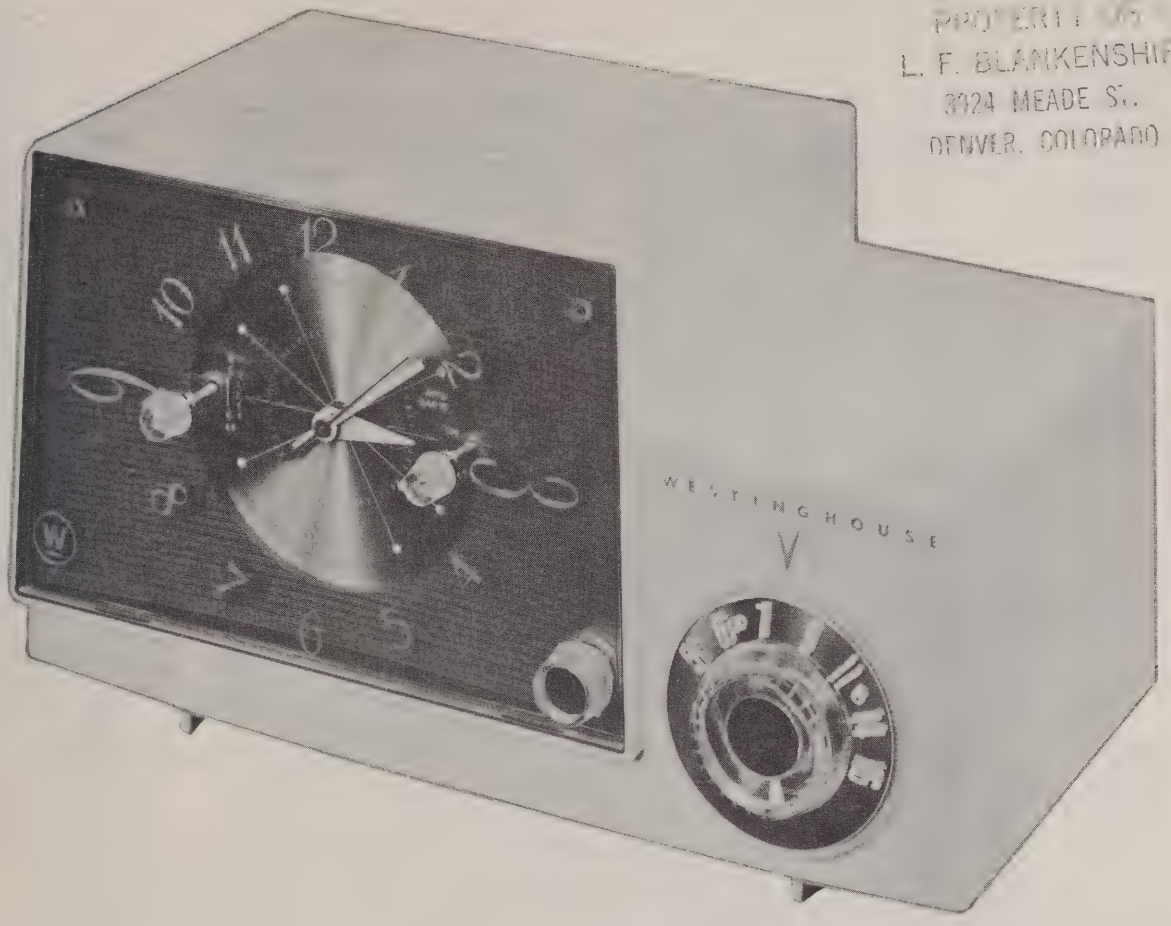
3124 MEADE ST.
DENVER, COLORADO

WESTINGHOUSE MODELS H-580T5, H-581T5, H-583T5 (Ch. V-2259-3)



WESTINGHOUSE MODELS H-580T5, H-581T5, H-583T5 (Ch. V-2259-3)

TRADE NAME	Westinghouse Models H-580T5, H-581T5, H-583T5 (Ch. V-2259-3)
MANUFACTURER	Westinghouse Electric Corp., TV-Radio Div., Metuchen, N. J.
TYPE SET	AC Operated AM Receiver With Electric Clock
TUBES (Five)	Types 12BE6 Converter, 12BA6 IF Amplifier, 12AV6 Det. - AVC - AF Amp., 50C5 Output, 35W4 Rectifier
POWER SUPPLY	105-120 Volts AC-60 Cycles
RATING	.27 Amp. @ 117 Volts AC (27 Watts Without Clock)
TUNING RANGE—BROADCAST	540-1600KC

ALIGNMENT INSTRUCTIONS—READ CAREFULLY BEFORE ATTEMPTING ALIGNMENT

Use isolation transformer, if available. If not, connect a .1mfd capacitor in series with low side of signal generator and B-. Volume control should be at maximum position. Output of signal generator should be no higher than necessary to obtain an output reading. Use an insulated alignment screwdriver for adjusting.

	DUMMY ANTENNA	SIGNAL GENERATOR COUPLING	SIGNAL GENERATOR FREQUENCY	RADIO DIAL SETTING	OUTPUT METER	ADJUST	REMARKS
1.	.01mfd	High side to pin 7 (grid) of V1 (12BE6). Low side to chassis.	455KC (400~ Mod)	Tuning gang fully open	Across voice coil	A1, A2, A3, A4	Adjust for maximum output.
2.	"	"	1625KC	"	"	A5	"
3.		Loop	1400KC	1400KC	"	A6	Fashion loop of several turns of wire and radiate signal into loop of receiver. Adjust for maximum output.

HOWARD W. SAMS & CO., INC. • Indianapolis 5, Indiana

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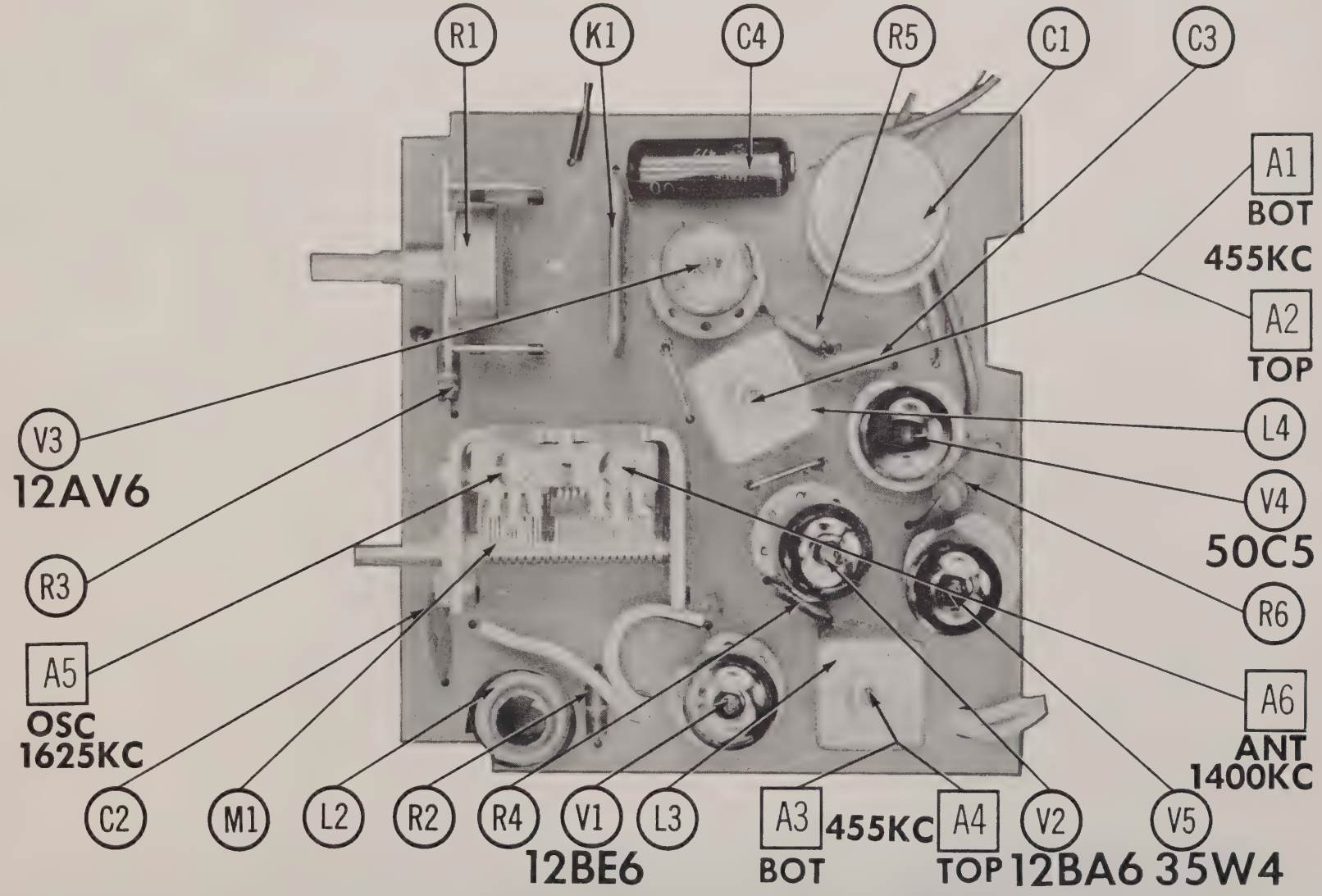


CHASSIS TOP VIEW

PARTS LIST AND DESCRIPTIONS

TUBES (GENERAL ELECTRIC, SYLVANIA)

ITEM No.	USE	TYPE	NOTES
V1	Converter	12BE6	
V2	1st IF Amplifier	12BA6	
V3	Det. - AVC - AF Amp.	12AV6	
V4	Output	50C5	
V5	Rectifier	35W4	

ELECTROLYTIC CAPACITORS

ITEM No.	RATING		REPLACEMENT DATA						
	CAP.	VOLT.	Westinghouse PART No.	AEROVOX PART No.	CORNELL-DUBILIER PART No.	MALLORY PART No.	PYRAMID PART No.	SANGAMO PART No.	SPRAGUE PART No.
C1A	■80	150	218V015H01	AFH2-19-05	BBRD8415	PFP214. 3	TDLD-10	MTD-303	R2563 *
B	▲30	150							

* Non Catalog Item

FIXED CAPACITORS

Capacity values given in the rating column are in mfd. for Paper Capacitors, and in mmfd. for Mica and Ceramic Capacitors.

ITEM No.	RATING		REPLACEMENT DATA							NOTES
	CAP.	VOLT	Westinghouse PART No.	AEROVOX PART No.	CENTRALAB PART No.	CORNELL-DUBILIER PART No.	ERIE PART No.	MALLORY PART No.	SPRAGUE PART No.	
C2	10000		215V111A03	BPD-01	DD-103	BYA6S1	ED-01	DC511	5HK-S1	
C3	10000	1000	215V300H03	DAC-27		BYA6S1M			BL-S10	
C4	. 047	400	V-10157-4473M	P488N-047	DF-503	CUB4S47		GEM-4147	4TM-S47	

CONTROLS

ITEM No.	RATING		REPLACEMENT DATA					INSTALLATION NOTES
	RESISTANCE	WATTS	Westinghouse PART No.	CENTRALAB PART No.	CLAROSTAT PART No.	IRC PART No.	MALLORY PART No.	
R1	500K	½	V-15767-3					Volume

RESISTORS

All wattages 1/2 watt, or less, unless otherwise listed.

ITEM No.	RATING		Westinghouse PART No.	NOTES
	OHMS	WATT		
R2	22K		250V232A23	
R3	3. 3meg		250V233A35	
R4	100Ω		250V231A01	Note 1
R5	180Ω		250V221A81	
R6	1500Ω	1	250V331A52	

Note 1. Some versions may use 150Ω in this application (Part #250V231A51).

TRANSFORMER (AUDIO OUTPUT)

ITEM No.	IMPEDANCE		REPLACEMENT DATA						NOTES
	PRI.	SEC.	Westinghouse PART No.	Halldorson PART No.	Merit PART No.	Stancor PART No.	Thordarson PART No.	Triad PART No.	
T1	2400Ω	3-4Ω	Part of SP1	Z1101	A-3025	A-3332	24S53	S-12X	

PARTS LIST AND DESCRIPTIONS (Continued)

SPEAKER

ITEM No.	TYPE			REPLACEMENT DATA		NOTES
	SIZE	FIELD	V. C. IMP.	Westinghouse PART No.	QUAM PART No.	
SP1	4"	PM	3-4Ω	V-15557-1 ①	4A07	① Includes T1

COILS (RF-IF)

ITEM No.	USE	REPLACEMENT DATA					NOTES
		Westinghouse PART No.	Meissner PART No.	Merit PART No.	Miller PART No.	Ram PART No.	
L1	Loop Ant.	310V009H02					Includes cabinet back.
L2	Osc. Coil	230V004H01					
L3	Input IF	V-15547-1	16-6780	BC-356	13-PC1	RF-4	
L4	Output IF	V-15547-1	16-6780	BC-357	13-PC2	RF-4	

COMPONENT COMBINATIONS

ITEM No.	USE	DESCRIPTION	Westinghouse PART No.	REPLACEMENT DATA
K1	Audio Coup. Net.	5000mmf, 250mmf, 5000mmf, 220mmf, 6. 8meg, 470K, 470K	219V001H01	Centralab PC-158 Erie 1408-02

MISCELLANEOUS

ITEM No.	PART NAME	Westinghouse PART No.	NOTES
M1	Tuning Cap.	330V010H01	2 Gang (Ant. 30-395mmf)

CABINETS & CABINET PARTS

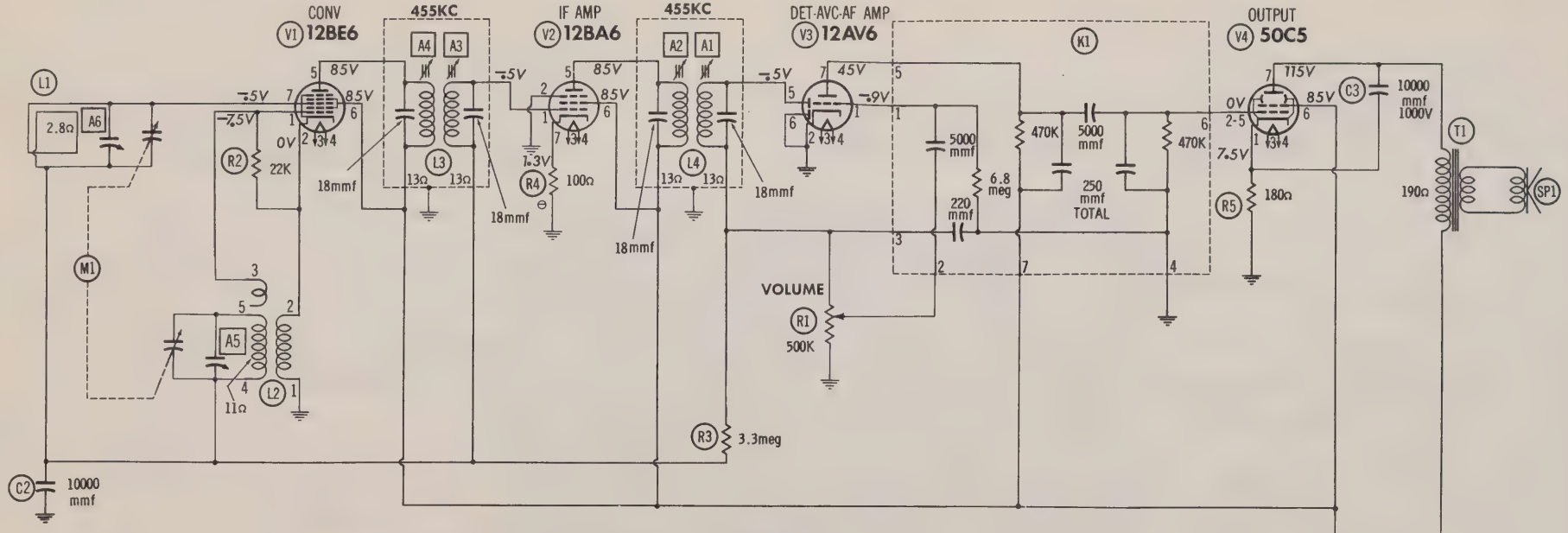
(When Ordering Cabinets & Cabinet Parts, Specify Model, Chassis & Color)

NAME	PART NO.	DESCRIPTION
Knob	550V014H02	Dial
Knob	550V015H01	Volume
Knob	V-11573-1	On-Off-Auto-Alarm, Models H-581T5 & H-583T5
Knob	V-16026-6	On-Off-Auto-Alarm, Model H-580T5
Cabinet	513V005H02	Model H-581T5
Cabinet	513V005H01	Model H-580T5
Cabinet	513V005H04	Model H-583T5
Crystal	558V020H01	Clock

WIRING DATA

General-use Unshielded Hook-up Wire ..... Use BELDEN No. 8530 (Solid) Available in Ten Colors
8524 (Stranded) Available in Ten Colors

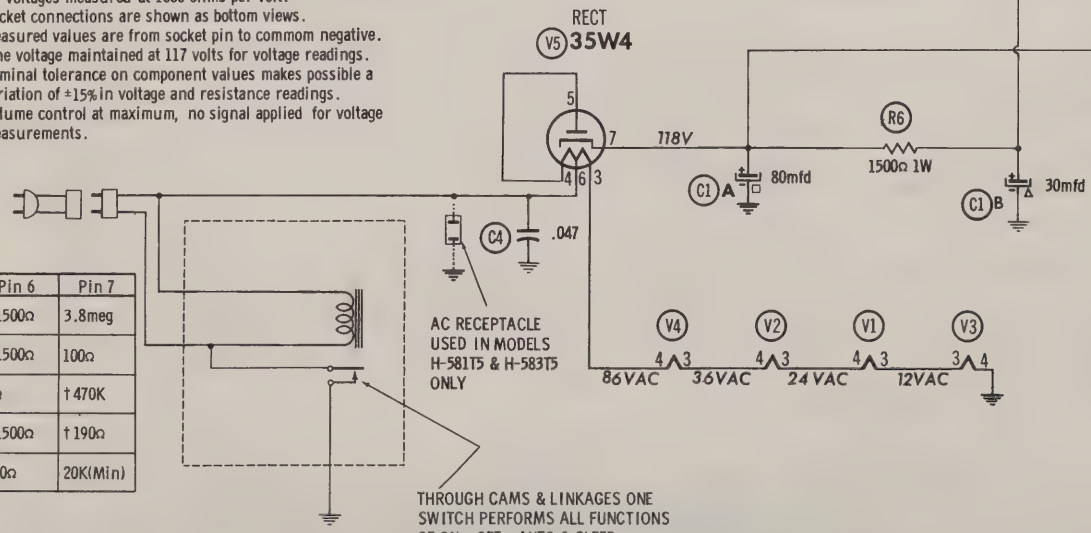
Power Cord ..... Use BELDEN No. 1765-B (6 Ft. Length)
1725-K (7½ Ft. Length)



OSC COIL
BOTTOM VIEW

1. DC voltage measurements taken with vacuum tube voltmeter; AC voltages measured at 1000 ohms per volt.
2. Socket connections are shown as bottom views.
3. Measured values are from socket pin to commom negative.
4. Line voltage maintained at 117 volts for voltage readings.
5. Nominal tolerance on component values makes possible a variation of ±15% in voltage and resistance readings.
6. Volume control at maximum, no signal applied for voltage measurements.

DC COIL RESISTANCE VALUES UNDER ONE OHM NOT SHOWN ON SCHEMATIC



RESISTANCE READINGS

ITEM	TUBE	Pin 1	Pin 2	Pin 3	Pin 4	Pin 5	Pin 6	Pin 7
V1	12BE6	22K	.9Ω	12Ω	24Ω	†1500Ω	†1500Ω	3.8meg
V2	12BA6	3.8meg	0Ω	24Ω	36Ω	†1500Ω	†1500Ω	100Ω
V3	12AV6	6.8meg	0Ω	12Ω	0Ω	500K	0Ω	†470K
V4	50C5	180Ω	470K	36Ω	86Ω	470K	†1500Ω	†190Ω
V5	35W4	NC	NC	86Ω	120Ω	120Ω	110Ω	20K(Min)

† MEASURED FROM PIN 7 OF V5
NC NO CONNECTION

A PHOTOFACT STANDARD NOTATION SCHEMATIC
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*TRADE MARK

EIA MEMBER ELECTRONIC INDUSTRIES ASSOCIATION

ZENITH MODELS S-14078, S-14079, S-14082, S-14083, S-14084, S-14085

...RY OF
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DENVER, COLORADO

ZENITH MODELS S-14078, S-14079, S-14082, S-14083, S-14084, S-14085

GENERAL INFORMATION

The Zenith Cobra-Matic Record Changers are designed to play in automatic sequence a stack of records and shut off both the changer and amplifier after playing the last record.

The Changer plays at four different turntable speeds; 16 2/3, 33 1/3, 45, or 78 r.p.m.

As many a ten 12", twelve 10" or any assortment of 10" and 12" records (providing they are of the same speed and same type of groove) may be intermixed in any order.

A stack of twelve 7", 33 1/3r.p.m. records or a stack of twelve 7", 45r.p.m. records (with the use of a "45" Adaptor Spindle)will also play on this changer.

Record separation is accomplished by movement of a finger in the center spindle. This finger directly separates records having a 1/4" centerhole and actuates the knives and shelves of the centerpost used for the playing of the 45r.p.m. records having a 1 1/2" centerhole.

This Changer is to be connected to an outlet supplying 110-120 volts, 60 cycle AC only, unless otherwise specified.

Supplied by:

Zenith Radio Corporation
6001 Dickens Avenue
Chicago 39, Illinois.

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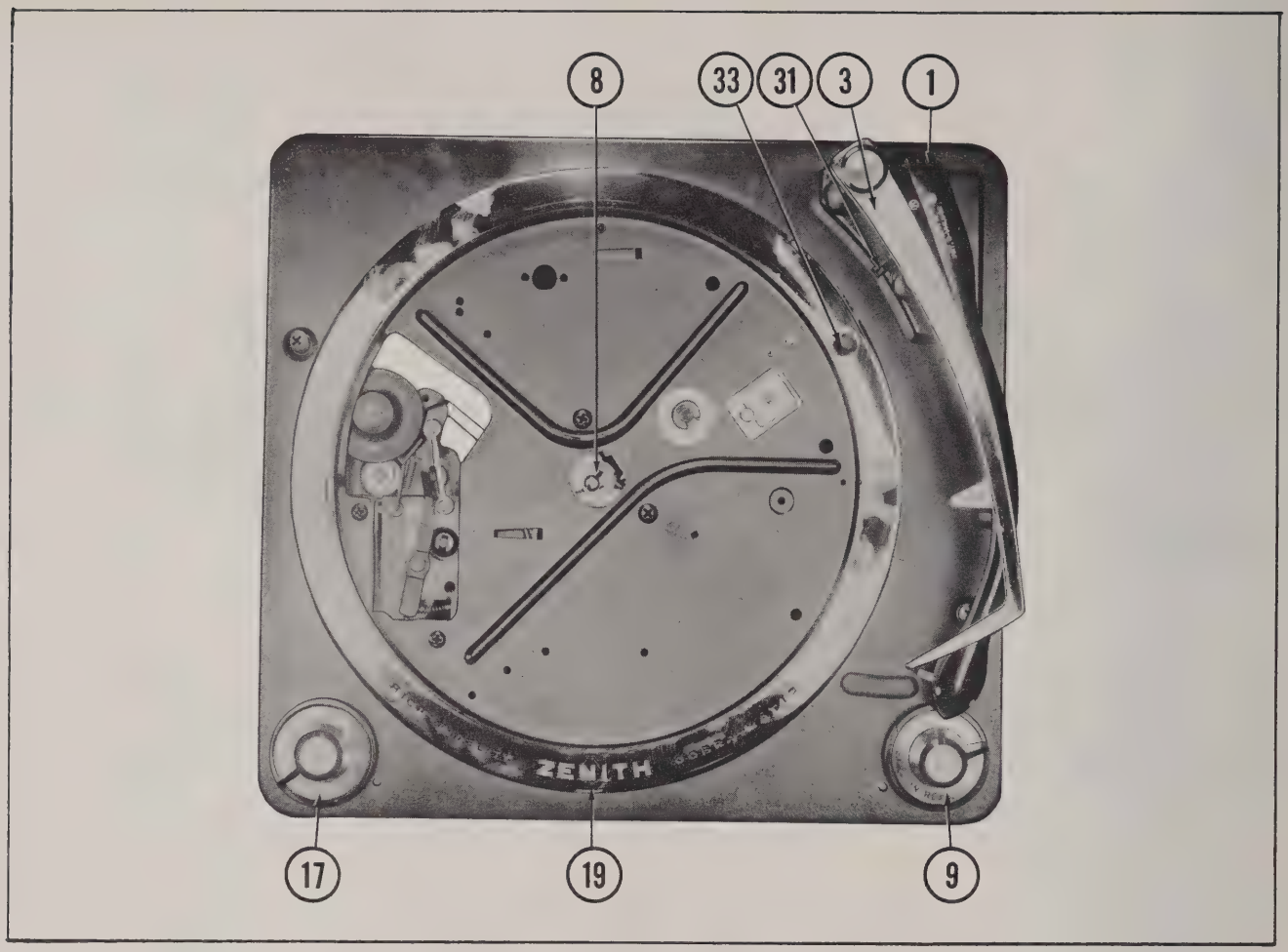

FIGURE 1

CONTROLS

Two controls are provided on the baseplate, one on the right front corner is the Off-On-Reject control and the one on the left front corner is the speed control.

By turning the Off-On-Reject control clockwise to the "On" position, the motor is energized and starts the turntable, when turned to the "Reject" position, it starts the mechanism into complete automatic operation. The mechanism will shut off automatically after the last record has been played but can be shut off manually by turning this control to the left (counter-clockwise).

The speed control has four normal positions, "16", "33", "45" and "78" to select the turntable speed desired.

PREPARING FOR OPERATION

Shipping Bolts

The changer must be floating freely on the mounting springs before placing in operation. To float the changer, turn the two shipping bolts in a clockwise direction as far as they will go.

Leveling Record Changer

It is essential to have the record changer absolutely level. Use a torpedo or similar type level on the record changer baseplate. Use adequate shims to level the record changer pan or combination cabinet to achieve perfect level.

OPERATING INSTRUCTIONS

Loading

1. Pull straight up on record support (3) until record support clears spindle, swing support out over pick-up arm.

2. Place records on spindle and lower to offset shelf. Hold records level and replace record support over spindle.

Starting

To start the changer, after checking that the stylus and speed controls are in the position corresponding to type records to be played, turn "Off-On-Reject" knob to "Reject" and release. The changer will operate automatically until the last record has been played, at which time, the pick-up arm is returned to its rest and the supply to the motor is switched off.

Rejecting

To reject a record at any time while the changer is operating, turn "Off-On-Reject" knob to "Reject" and release.

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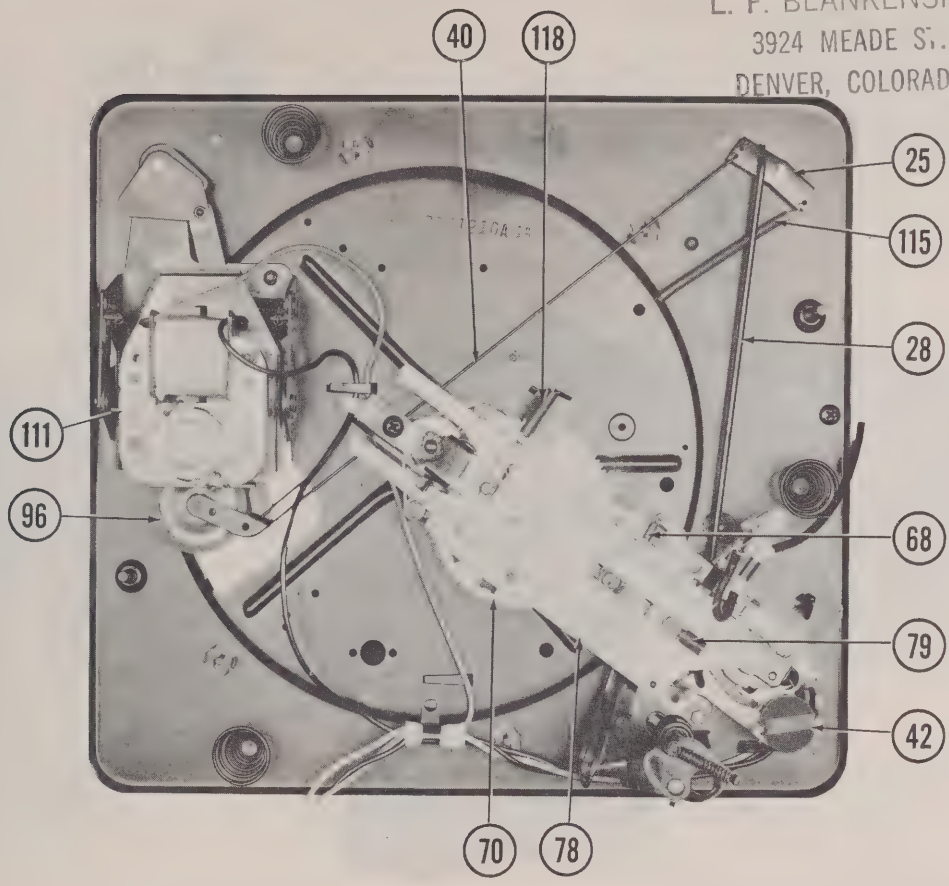

FIGURE 2

Stopping

The changer may be stopped any time a record is playing by turning changer control knob to "Off". Lift pick-up arm and place on rest.

Unloading

Lift record support clear of spindle and swing out over pick-up arm. Using both hands, with fingers under the edge of bottom record, lift records straight up and off spindle.

Manual Operation

Records that do not have starting and fast-finishing grooves must be played manually. To play records manually, lift the record support arm and swing to the right until clear of the turntable. Place record on spindle and lower to spindle shelf. Tilt record down toward left front of baseplate and lower to turntable. Turn changer control knob to "On" position only. Gently place needle on record.

Repeating Of 7", 10" Or 12" Records

To repeat a record, swing record support clear of turntable, place record on turntable and start changer. Record repeats until control is turned "Off". If a 12" record is repeated, wait for the changer to finish cycling and reposition the pick-up arm manually to the 12" position.

CHANGE CYCLE

It is recommended that the change cycle operation be observed by rotating the turntable by hand. The action described below can then be readily followed and the function of each part more easily understood.

This changer is provided with what is known as velocity trip mechanism. The change cycle is started by the faster inward motion of the pick-up arm when the needle enters the trip grooves at the end of the record. Only records having fast-finishing grooves will operate this trip.

The pick-up arm and hinge assembly, and trip finger cam and shaft assembly (49) are secured together so that they move in unision. As the pick-up arm nears the end of a record, trip finger cam (49) pushes trip link (76), which, in turn, engages and pivots trip lever (75). As trip lever (75) pivots, pawl lever (73) pivots with it carrying the trip pawl toward the hub on the turntable. While a record is playing, the small motion of the trip pawl is not sufficient to cycle the mechanism because on each revolution of the turntable the wiping contact by the hub projection moves the trip pawl back to clear the projection.

In the first revolution of the turntable during which the pick-up arm advances rapidly, the trip pawl is moved far enough to definitely engage the projection on the turntable hub. The contact between the trip pawl and the turntable hub projection gives the necessary push for the teeth in main gear (70) to engage the teeth in the turntable hub, thus causing main gear (70) to rotate. This in turn, starts the lateral

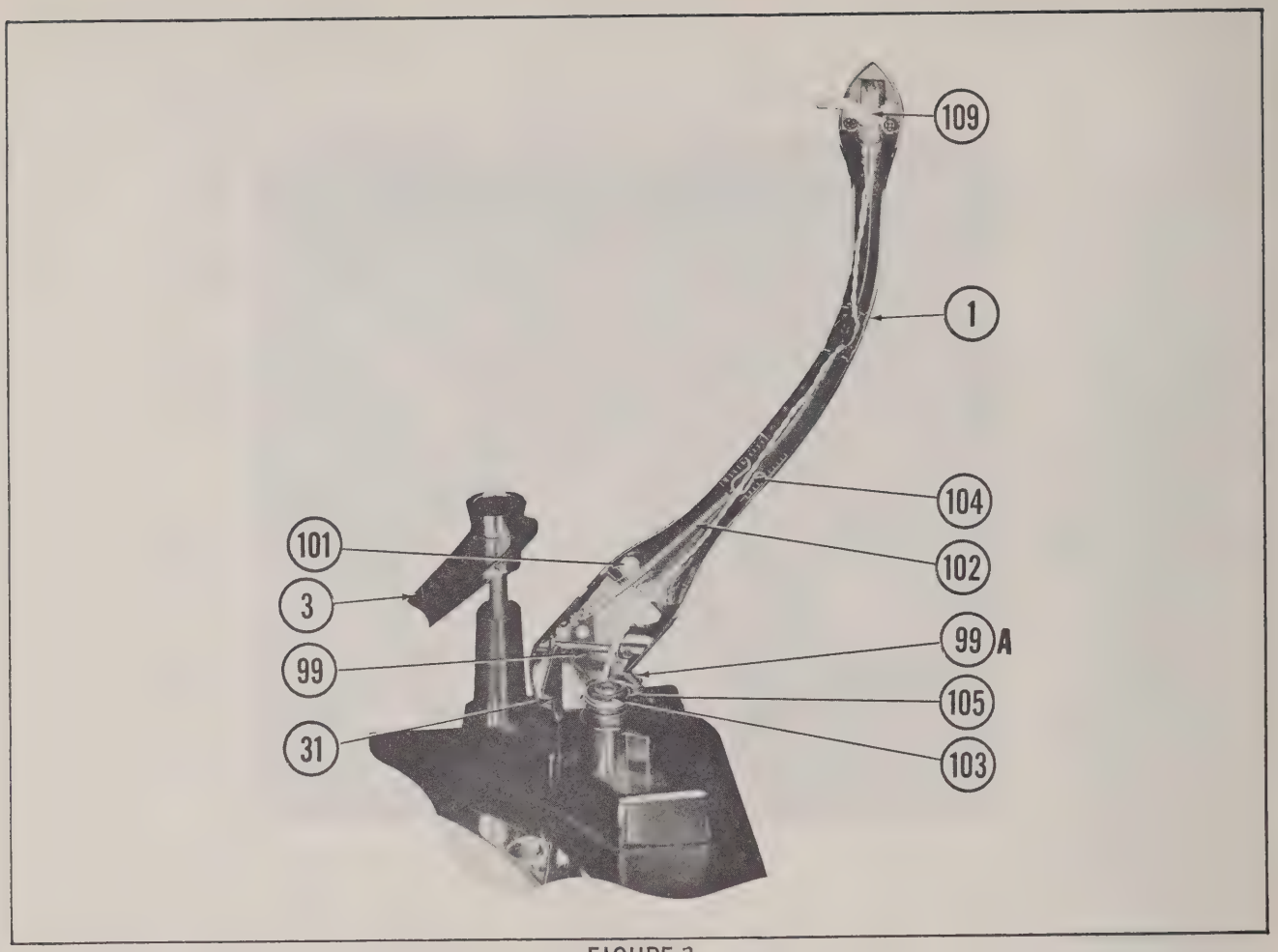

FIGURE 3

travel of the slide assembly (78). This slide assembly (78) moves to the rear thru the action on an eccentric mounted pin on main gear (70), which rides in the cross slot on the slide assembly (78).

As the slide assembly begins to move, the cam surface on the rear of the slide pushes lift pin (108) upward, raising the pick-up arm clear of the record. At the same time, trip finger cam (49) is pushed up by the force transferred through lift pin spring (51). The raising of trip finger cam (49) causes the two formed dimples in the trip finger cam to engage the two holes in the pick-up arm return locator (45), and couple them together. This directs the movement of the pick-up arm during the change cycle.

Slide assembly (78) continues to move away from the centerpost until the formed end of slide (78) pushes against the pick-up arm return locator (45). This relieves the force of pick-up arm return locator (45) against shut-off lever assembly (66), permitting shut-off lever spring (65) to return the shut-off lever (66) to the normal (raised) position.

After cycling slide (78) has raised the pick-up arm and is moving it outward, the tab on front of slide assembly (78) contacts the ejector bracket assembly (87). Ejector bracket (87) moves push rod (56) upward, actuating spindle assembly (8), to drop a record to the turntable.

Simultaneously, the trip pawl on top of main gear (70) contacts and rides along the curved finger of the retart and clip assembly (67). This action moves the trip pawl and its associated levers into a neutral position. This prevents the trip pawl from re-engaging with the projection on the turntable hub which would start a new change cycle.

At this time, the cam surface of the bracket located on top of main gear (70) moves reset lever (61) to its mid-position (10" set-down) where it is held by the 12" record selector (31). Slide assembly (78) continues to the rear and then starts forward.

If 7" records are being changed, the rubber bumper (33) on 7" set-down lever (58) is free to move upward. This action on 7" set-down lever (58) raise reset lever (61) to the upper position (7" set-down).

If 10" records are being changed, the 7" set-down lever (58) will not operate as the rubber bumper (33) will contact the edge of the 10" record and reset lever (61) will remain in the mid-position (10" set-down) as originally placed by the caming action of the bracket on top of main gear (70).

When a 12" record drops to the turntable, it strikes the 12" record selector (31) and forces it backward. This disengages the end of reset lever (61) from the edge of the 12" record selector (31) and permits the reset lever (61) to drop down into the recess at the bottom of the 12" record selector (31). This position of the reset lever (61) causes it to engage the bottom step of the pick-up arm return locator (45) and will cause the pick-up arm to land on the edge of a 12" record.

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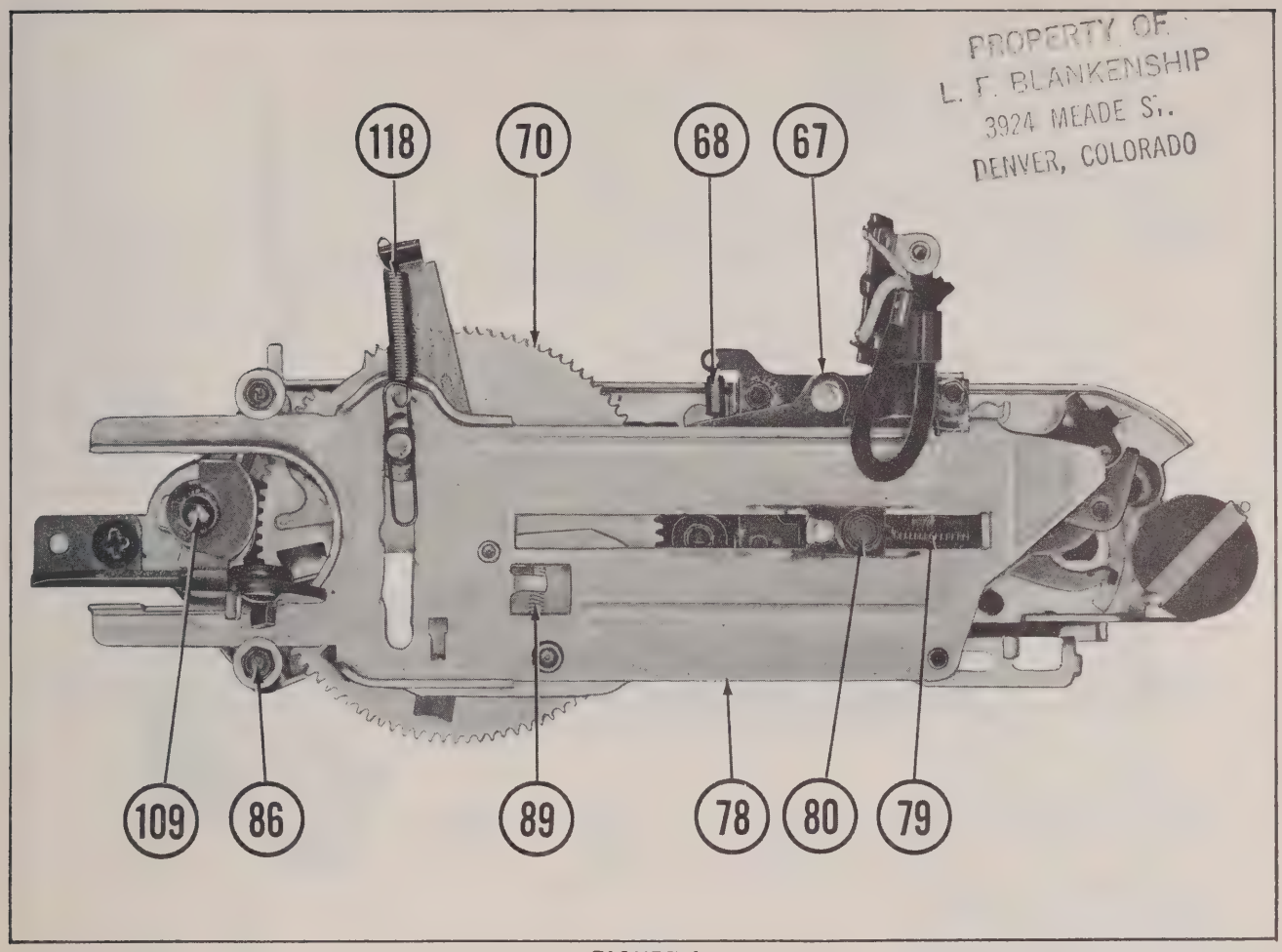

FIGURE 4

As the slide assembly (78) continues forward, the tab on the rear of the slide moves clear of the pick-up arm return locator (45) and the trip finger cam (49), which are still locked together. This action permits the pick-up arm return spring (43) to move the pick-up arm inward until one of the three set-down steps in the pick-up arm return locator (45) strike the reset lever (61), which has been positioned by the record being changed. This stops the inward movement of the pick-up arm directly above the point of landing. The pick-up arm is then lowered to the lead in groove of the record as the lift pin (108) rides down the incline on the rear of the slide assembly (78). As the pressure is released from lift pin spring (51), trip finger cam (49) and pick-up arm return locator (45) separate. This permits the pick-up arm to move freely across the record.

After the mechanism has been tripped, it again follows the preceding sequence of cycling and playing the records until the last record of the stack has been played.

As the last record of the stack drops to the turntable, the record support (3) drops below the shelf on the spindle assembly (8) and the lower end of record support shaft (82) contacts the stop arm on the record support guide assembly (83). The stop arm in turn applies force to shut-off lever (66). At this moment the cycling slide (78) is in the outermost position (away from center-post) and the end of the shut-off lever (66) is forced against the escape lever (78A) which prevents it from lowering further.

As the cycling slide (78) returns to the out of cycle position, the end of shut-off lever (66) slides off the escape lever (78A) permitting the end to extend down through the slot in the cycling slide. At this time the pick-up arm has rotated too far to be blocked by the other end of the shut-off lever (66) and the pick-up is permitted to land on the record.

After the last record has been played, the mechanism again goes into change cycle, and the cycling slide (78) moves into its outermost position. At this moment the force which has been applied to the shut-off lever (66) from the record support shaft (82) causes the end of shut-off lever (66) to lower, thus extending further through the slot in cycling slide (78). The other end of shut-off lever (66) raises and blocks the pick-up arm return locator (45) which at this moment is held back by the cycling slide (78).

As the cycling slide (78) moves back toward the centerpost, it carries the raised trip link (76) along until finally the formed end of the trip link (76) pushes control lever (41) which in turn actuates power switch (42). This removes power from the motor and the mechanism stops.

As the slide assembly moves to the out of cycle position, lift pin (108) rides down the incline and lowers the pick-up arm to the rest post (14).

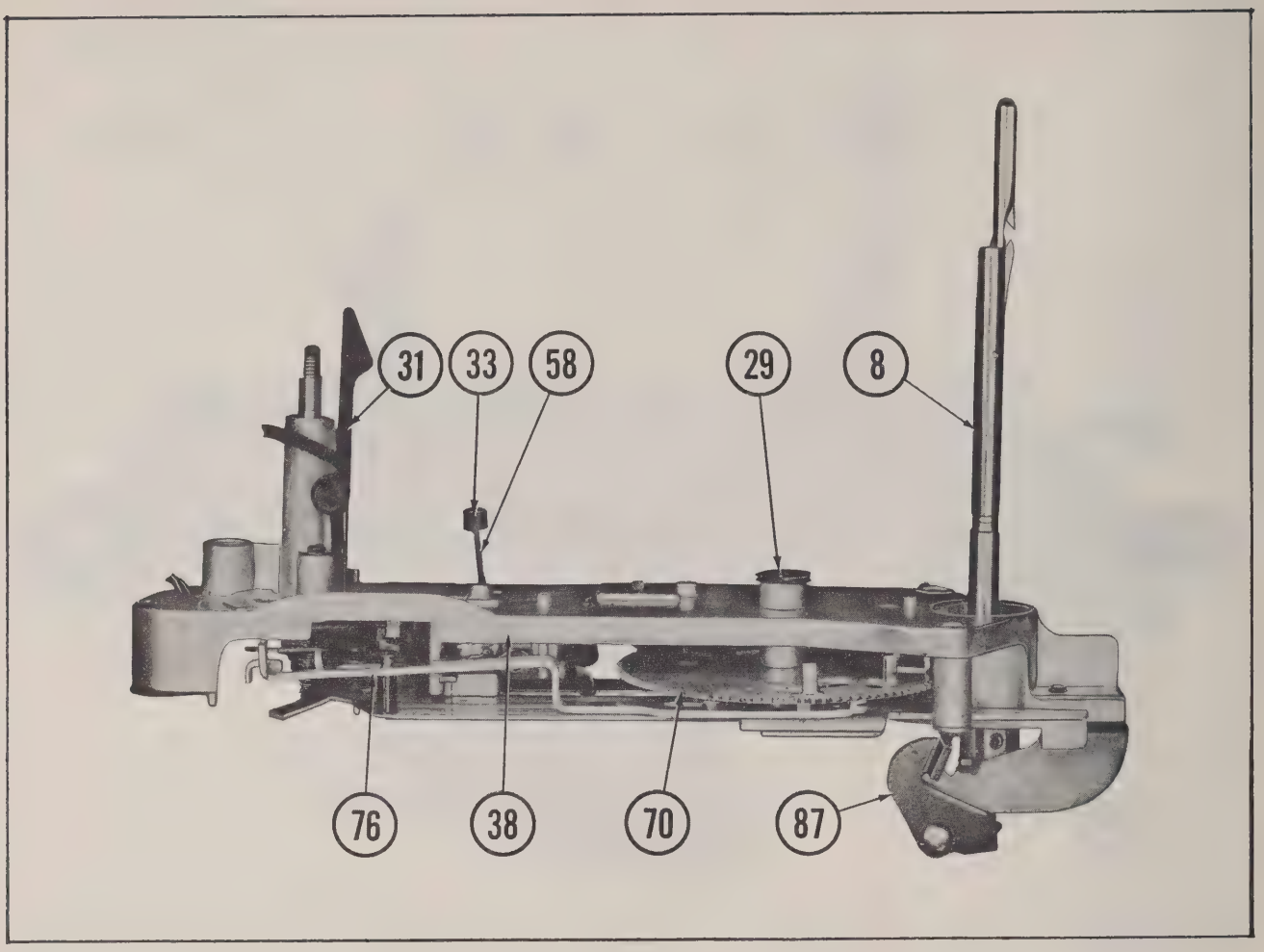

FIGURE 5

LUBRICATION

Additional lubrication should not be required for the life of the changer, but in cases of unusual use or high operating temperature, the changer should be lubricated as follows:
(Refer to the exploded view)

Apply Andok "B" or Texaco Sta-Put to:

1. Edges of all slots in slide assembly (78).

2. Outer edges on forked end of slide assembly (78).

3. Lift pin cam surface on slide assembly (78).

4. Lower surfaces of pick-up arm return locator (45).

5. Inner surface of tab on rear of slide assembly (78).

Apply a small quantity of light mineral oil to:

1. Trip finger cam shaft (49).

ADJUSTMENTS

Needle Set-Down

The set-down position of the needle is adjusted by means of the set-down adjustment (99A) mounted on the hinge arm assembly (99). Turn this screw adjusting pick-up arm for correct set-down on a 10" record. When the correct set-down is obtained for the 10" position, the 12" and the 7" needle set-down will also be correct.

Pick-Up Arm Height

The pick-up arm height is adjusted by the lift screw (101). To raise the height of the pick-up arm, turn this screw counter-clockwise. To lower the pick-up arm, turn clockwise. The pick-up arm height should be adjusted so that with a 1 1/8" stack of records on the turntable, the pick-up arm lifts 1/4" straight up as the change cycle starts.

Needle Pressure

The needle pressure should be between 8 and 10 grams. Adjustment is made by placing weight adjusting spring (104) in the slots on the underside of the pick-up arm, which give the desired pressure.

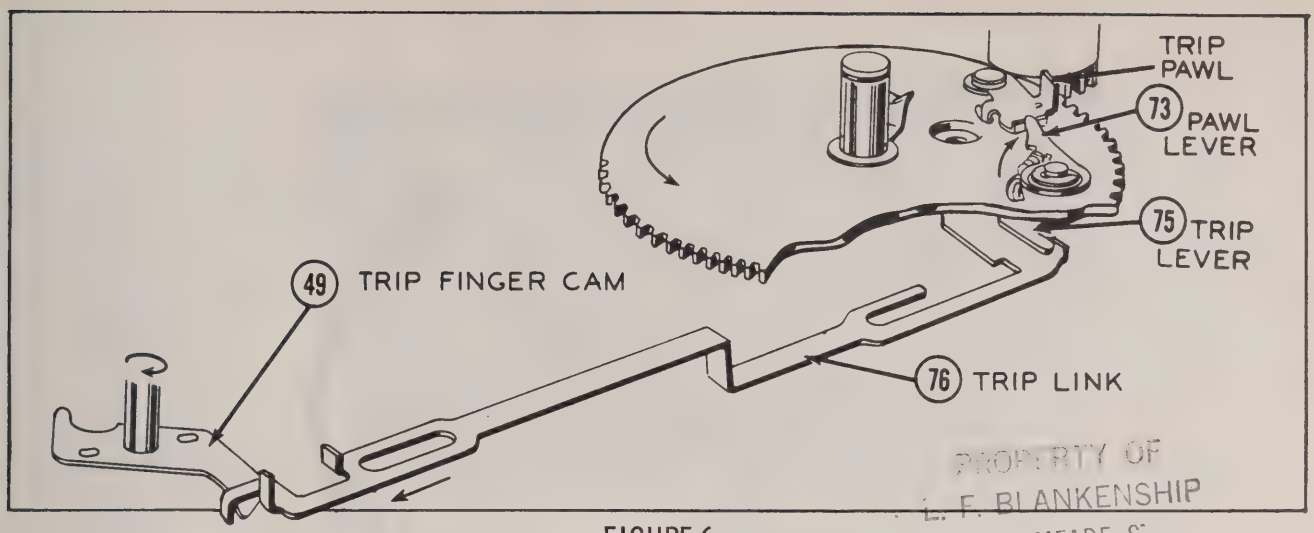

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FIGURE 6

TROUBLE CHART

SYMPTOM	CAUSE	REMEDY
Turntable does not revolve when control is turned "On".	1. No current at motor.	(a) Check that current is reaching AC leads of changer. (b) Check that switch is closing. (c) Check wiring and soldered terminals in the changer.
	2. Motor defective.	(a) Remove turntable to allow motor to operate without load. If current is reaching motor and drive spindle does not rotate, the motor is defective. Repair or replace.
	3. Motor idler wheel not engaging turntable rim.	If drive spindle is turning but turntable is not: (a) Check motor idler ass'y to determine if it is free to contact the drive spindle and turntable rim. (b) Wipe off inside rim of the turntable (5) to remove flock, or if oily, clean the turntable rim and rubber tire of the idler wheel with naptha or alcohol.
	4. Motor not in detent completely.	Check speed change slide for freedom of operation.
Changer does not cycle when the control knob is turned to "Reject"	1. The manual reject not actuating the trip.	(a) Turn the control knob (9) to the reject position, hold and see that the control shaft ass'y (41) has moved the trip link (76) to the rear. This should actuate the trip pawl on the main gear (70) which will bring the spur on the trip pawl in contact with the hub gear on the turntable hub. (b) Check for binding of the pawl lever (73), the trip lever ass'y (75) and the trip pawl.

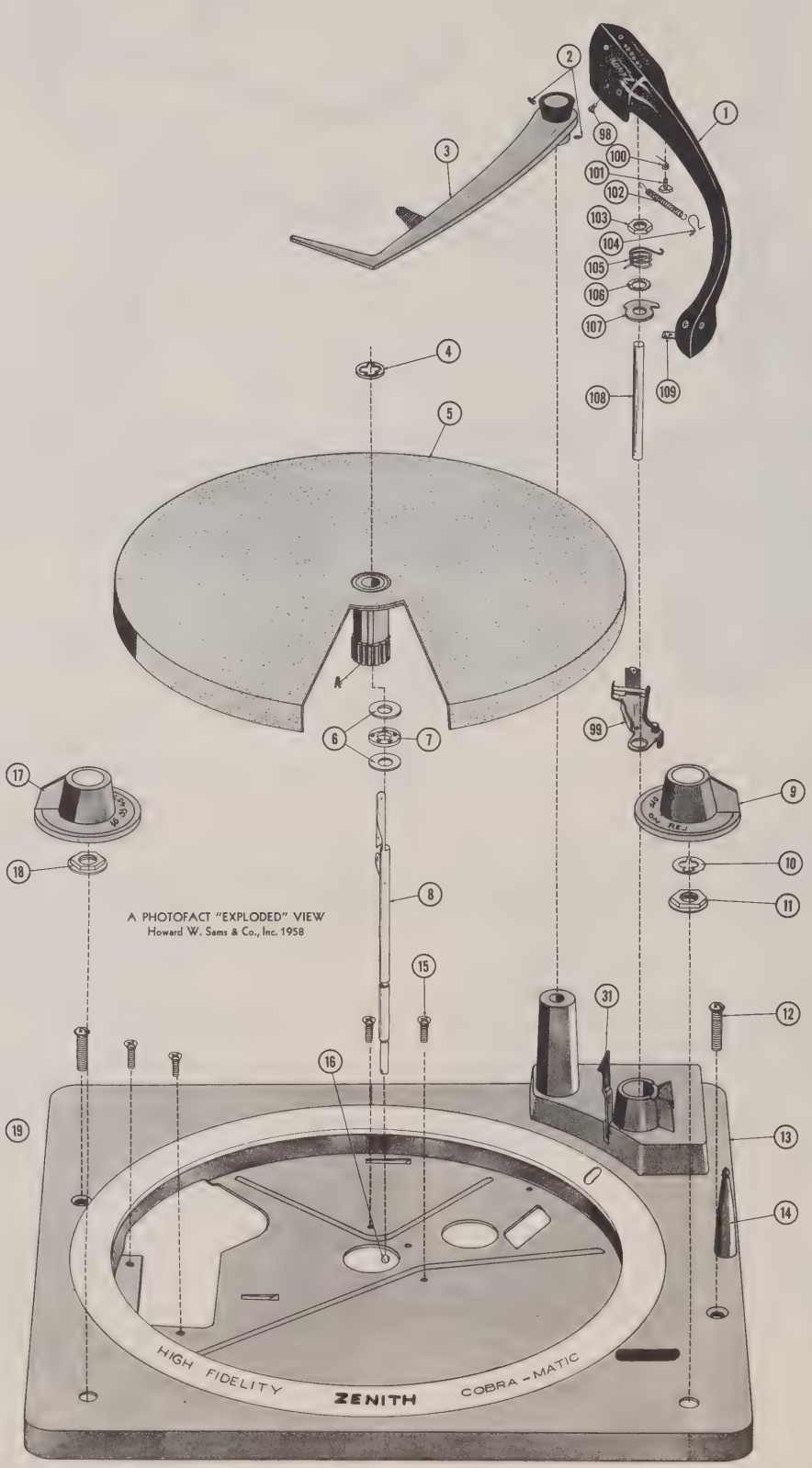


FIGURE 7A. EXPLODED VIEW OF PARTS ABOVE BASEPLATE

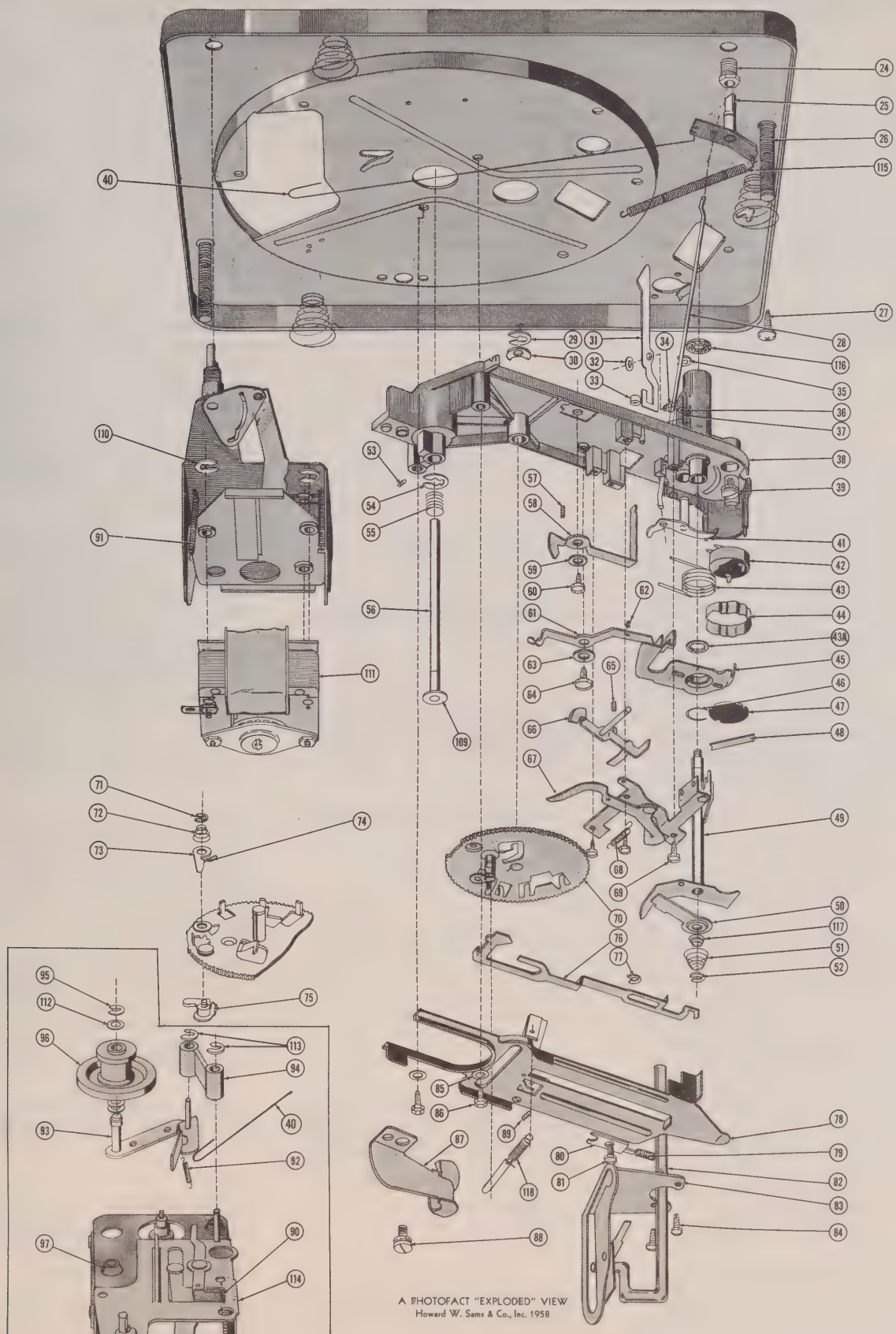


FIGURE 7B. EXPLODED VIEW OF PARTS BELOW BASEPLATE

TROUBLE CHART-CON'T.

SYMPTOM	CAUSE	REMEDY
		If binding occurs, clean out all foreign matter and check for freedom.
Control knob cannot be turned to "On" position.	1. Machine shut off during cycle.	Turn the turntable clockwise by hand, until the control knob (9) is free.
Pick-up arm strikes records on spindle when it raises, or pick-up arm rest when it moves out.	1. Pick-up arm height not adjusted properly.	(See instructions for adjusting pick-up arm height under "Adjustments").
Turntable speed too slow (refer to exploded view.)	1. Binding in turntable bearing.	Check the turntable bearing for freedom. Hold the motor idler wheel out of engagment with the turntable and spin the turntable, by hand, to see if it turns readily and coasts for a long time. If binding occurs, remove turntable, clean off foreign matter, and lubricate with light mineral oil.
	2. Line voltage too low.	The line voltage should not be less than 105 volts or the turntable may be too slow.
	Operating temperature too low.	If the machine has been stored in a cold place or operated in surroundings at a temperature of less than 60° F., the turntable speed may be too slow.
Turntable stalls or slows down during cycle (refer to exploded view).	1. Motor idler not engaging turntable.	(See "Turntable Does Not Revolve When Control Knob is Turned to "On" Position").
	2. Binding in drive mechanism.	Hold idler away from turntable, or remove idler wheel. Cycle machine by turning turntable slowly by hand. The main gear should turn freely for the complete revolution without binding at any point. (a) If binding occurs, check for foreign matter in the gear teeth, a bent gear bearing, or bent spindle bushing. Straighten or replace. Clean and lubricate.
	3. Binding between pick-up arm lift pin (108) and lift pin cam surface on slide and cam ass'y.	Lift pin should ride freely on cam surface without binding.
	4. Motor weak.	When everything checks all right, but the changer still stalls in cycle, the motor may be weak. Replace motor.
	5. Grease on idler wheel.	Wipe off idler wheel rubber tire; inner rim of turntable with naptha or alcohol.
	6. Idler wheel tension spring weak	Replace spring or bend motor tension spring anchor bracket to give desired tension.

SYMPTON	CAUSE	REMEDY
Changer continues to cycle.	Reject mechanism binding.	(a) Make certain the trip link (76) is not frozen in the reject position. (b) Make certain the changer control lever (41) is not binding and that it actuates the trip link (71) when the changer control knob (9) is turned to reject. (c) Check for binding of trip pawl, trip lever (75) and pawl lever (73); these must be free to turn easily. (d) Check the changer control linkage (28) and (41).
Noise during playing of record	1. Motor rumble.	If a low-pitched rumbling sound comes from the loud speaker while a record is being played, check motor grommets to be sure the motor is freely suspended on them. The motor lead wires should have slack to allow the motor to float Motor rumble may also come from an unbalanced motor rotor; in this case, replace motor.
	2. Defective turntable bearings (7).	Defective turntable bearings can cause rumble. Check for foreign matter in the bearing, defective balls, binding between balls and ball retainer; rough surface on washers. Clean ball bearing, sleeve bearing, and washers; lubricate with light mineral oil.
	3. Defective motor idler wheel.	A rapid thumping sound while the motor is running may indicate a flat spot on the motor idler wheel. If this condition does not clear up after ten minutes of running time, remove the turntable and check the rubber tire on the idler. If the surface of the rubber tire is not smooth and even, replace the part. Should the bearing of the idler wheel show signs of excessive wear or be extremely wobbly, the idler wheel should be replaced.
	4. Defective record.	Worn or defective records cause needle scratch and distortion of the recorded sound If the record is warped, it may slip on the other records causing "Wow" (a waver in the recorded sound). An enlarged hole in the record can also cause "Wow".

TROUBLE CHART-CON'T.

SYMPTOM	CAUSE	REMEDY
	5. Turntable scrapes.	If a scraping sound occurs as the turntable revolves, check: (a) Turntable warped, causing outer rim to rise and fall. (b) Motor idler or mounting plate bent.
	6. Squeaks	Squeaking sound as changer operates, indicates lack of oil Lubricate points indicated under "Lubrication".
	7. 7" lever (58) loose.	Check 7" lever washer (59) and screw (60) to see if they are tight.
Distortion of recorded sound.	1. Defective record.	(See "Noise During Playing of Record).
	2. Defective amplifier.	Check phonograph amplifier and speaker.
	3. Bad Cartridge.	Replace.
	4. Bad needle.	Replace.
No sound during playing.	1. Defective cartridge.	Replace.
	2. Defective wiring.	Check pick-up leads for a shorted or open lead.
	3. Defective amplifier.	Check phono amplifier and speaker.
	4. Loose cartridge terminal clips.	Remove, squeeze together slightly, and replace.
Excessive record wear.	1. Binding on pick-up arm.	(See "Needle Does Not Track Across Record Properly").
Changer does not shut off after last record has been played.	1. Record support (3) binding.	The record support must drop below the off-set shoulder of the spindle or the changer will not shut off. (See "Two Records Drop at Once").
	2. Lever assembly (66) binding.	Clean out dirt and make sure this operates smoothly.
	3. Shut-off bracket binding.	Check bracket and if bent, straighten.
	4. Shut off lever not engaging locator.	Adjust tab on slide that rotates the locator and trip finger when unit is cycling.
Rough pick-up arm motion.	1. Horizontal defects.	(a) Check pick-up arm return locator (45) for tightness. (b) Check that pick-up arm return spring (43) is not weak and is hooked up properly.

SYMPTOM	CAUSE	REMEDY
		(c) Check that fibre washer (43A) is installed under pick-up arm return locator.
	2. Vertical defects.	(a) Lift pin (108) binding; clean out dirt and lubricate.
		(b) Slide and cam (78) binds; check bearing points, clean and lubricate.
		(c) Burrs in main slot in slide and cam (78), remove with fine file.
		(d) Ejector lever on ejector bracket assembly (87) binding. Straighten, remove burrs, and lubricate.
		(e) Pick-up arm shaft and sleeve binding; clean and lubricate.
Noisy during change cycle.	1. Tines on the forked end of the slide and cam ass'y (78) bent.	Replace.
	2. Lack of lubrication. Griding noise.	Lubricate ejector lever (87) where it contacts lower end of spindle (56).
Control knob does not detent on "33", "45", or "78" position.	1. Detent spring off or broken.	Replace.
Cartridge drags on record.	1. Needle bent.	Replace.
	2. Cartridge mounting screws loose.	Tighten.
Shuts off when last record drops.	1. Shut-off bracket (83) bent.	Straighten or replace.
	2. Record support bent.	Bend down slightly so record support (3) is parallel with the baseplate.
	3. Loose shut off lever ass'y (66).	Tighten
Will not play manually	1. Trip link (76) bent.	Straighten or replace.
	2. Trip finger cam (49) bent.	Straighten or replace.
Impossible to adjust set-down.	1. Pick-up arm shaft and sleeve ass'y (49) defective.	Shift the safety plate (107) toward the eccentric set-down adjusting screw (99A), and tighten pick-up arm shaft and sleeve nut (103). Hold pick-up arm against rear stop and push on trip finger cam (49) The safety plate (107) should move away from the set-down adjusting screw (99A) and snap back when the trip finger cam (49) is released; if it does not, replace the pick-up arm shaft and sleeve ass'y (49).

SYMPTOM	CAUSE	REMEDY
		Hinge pivot screws may be adjusted favoring one side or the other.
Record does not drop when changer cycles.	1. Spindle pusher shaft (56) broken or bent.	Replace push shaft (56).
	2. Record finger in spindle not moving far enough forward to eject a record.	The record finger should move forward until it has reached a point flush with, or a miximum of, .010" beyond the spindle body (8). To insure that the record finger is all the way forward, push rod (56) should be raised high enough by the ejector lever to slightly compress the pusher spring. (See "Turntable Stalls During Cycle"). If the spring is compressed and the record finger does not move far enough forward to eject a record, the spindle (8) should be replaced. If a record is not pushed completely off the ledge, it may hang on the spindle momentarily, then drop on the pick-up arm when it moves in over the turntable.
	3. Check that ball bearing (16) is not missing.	Replace
Two records drop at once.	1. Hole in record too large.	Check the diameter of the hole in the record. An oversize hole will cause two records to drop at once.
	2. Spindle guide not fully down.	If the spindle guide is not all the way down, more than one record may be dropped at a time. (a) Check the guide to be sure it is free and does not bind at any point. Clean out foreign matter and straighten if necessary. Do not oil. (b) When records are placed on the spindle, be sure the guide is all the way down. The guide will normally raise as a record is being dropped, but it should return to place immediately by gravity.
	3. Record pusher (56) defective.	The record pusher (56) may be deformed, etc. This may cause two records to drop at once. Replace with new pusher or replace spindle ass'y.
	4. Slight play in spindle (8).	Tighten spindle set screw (53).
Record hits pick-up arm.	1. Record finger not moving far enough forward to eject record.	(See "Record Does not Drop When Changers Cycles").

SYMPTOM	CAUSE	REMEDY
	2. Record finger extending beyond outside diameter of spindle.	Cycle changer, by hand, until pusher shaft (56) is at the top of its travel. Using new record as a guage, pass it over the spindle to see if it binds at any point. File off high points on record finger with a fine file, until record will pass freely over spindle.
	3. Pick-up arm not adjusted properly.	(See "Adjustments").
Needle does not set down on 10" record in proper position.	1. Pick-up arm not adjusted properly.	(See "Adjustments").
		(a) Loose nut (103) on pick-up arm shaft and sleeve (49).
	2. Pick-up arm shaft and sleeve (49) binding.	File off burrs and rough surfaces. Polish and lubricate shaft.
	3. 7" set-down lever (58) and 12" record selector (31) not operating properly.	Insure that the proper operation and reset of the 7" set-down lever (58) and 12" record selector (31) is not being interferred with.
	4. Needle bent.	Replace with new needle.
	5. Wire spring broken.	12" record selector (31) does not cock; check for broken 12" record selector spring (37).
	6. Bent pick-up arm return locator (45).	Straighten or replace.
	7. Bent trip finger cam (49).	Straighten or replace.

MECHANICAL PARTS LIST

Changer No.	Code	Changer No.	Code
S-14078	K	S-14083	N
S-14079	L	S-14084	O
S-14082	M	S-14085	P

All Changers A

Ref. No.	Part No.	Code	Description		Ref. No.	Part No.	Code	Description
1	VM14658A	K, M, O, P	Tone Arm		5	VM9455-S	A	Turntable Ass'y
	VM14658B	L, M	Tone Arm		6	VM6877	A	Bearing Washer (2)
2	VM14603	A	Set Screw, Record Support (2)		7	VM6876	A	Ball Bearing Retainer
					8	VM6049	A	Spindle
3	VM14723A	K, M, O, P	Record Support & Knob Ass'y		9	VM14588	A	On-Off-Reject Knob
					10	VM1652	A	"C" Washer, Control Shaft
	VM14723B	L, N, P	Record Support & Knob Ass'y		11	VM8398	A	Pal Nut
4	VM1650	A	"C" Washer, Turntable Retainer		12			Mounting Screws (2)

MECHANICAL PARTS LIST-CON'T

Ref. No.	Part No.	Code	Description
13			Baseplate
14	VM5573-T	A	Tone Arm Rest Post
15	VM6929	A	Screw #8-32 x 3/16 (4)
16	VM6884	A	Ball Bearing
17	VM14587	A	Speed Control Knob
18	VM1720	A	Speed Nut
19	VM14583A	K, M, O, P	Bezel, Chrome with Red Silk Screening
	VM14583B	L, N	Bezel, White with Black Silk Screening
24	VM6916	A	Control Bushing
25	VM7114	A	Control Lever Ass'y
26	VM15044	A	Mounting Bolt (2)
27	VM2916	A	Screw, Rest Post Mounting
28	VM6919	A	Reject Rod
29	VM1719	A	"C" Washer, Main Gear Ass'y
30	VM9762	A	Spring Washer
31	VM2957	A	12" Record Selector
32	VM1588	A	"C" Washer
33	VM2580	A	Rubber Bumper for 7" Set Down Lever
34	VM4172	A	Compression Spring
35	VM1652	A	"C" Washer
36	VM1720	A	Speed Nut
37	VM2563	A	Spring 12" Record Selector
38	VM6968	A	Die Cast Frame
39	VM101	A	Screw, #10-24 x 3/8 Sems B. H.
40	VM7112	A	Retraction Rod
41	VM2284	A	Switch Control Shaft Ass'y
42	VM467	A	Switch
43	VM9533	A	Return Spring
43A	VM2952	A	Fibre Washer
44	VM2931	A	Fibre Insulating Strip, Switch
45	VM6405	A	Locator and Bushing Ass'y
46	VM5828	A	Retainer Ring-Locator Plate
47	VM2573	A	Switch Cover
48	VM4212	A	Retainer-Switch Cover
49	VM9565	A	Trip Finger Cam and Shaft Ass'y
50	VM9557	A	Retard Lever
51	VM14871	A	Lift Pin Spring
52	VM1588	A	"C" Washer
53	VM6955	A	Set Screw, #8-32 x 1/4 (2)
54	VM5022	A	"C" Washer
55	VM6885	A	Safety Spring
56	VM6874	A	Push Rod
57	VM2579	A	Spring-7" Set Down Lever
58	VM2581	A	7" Set Down Lever
59			Flat Washer-7" Set Down Lever
60			Screw, #6-32 x 1/4"
61	VM6007	A	Reset Lever
62	VM2925	A	Spring-Reset Lever
63			Flat Washer-Reset Lever
64			Screw, #6-32 x 1/4"
65	VM9663	A	Spring-Shut-Off Lever
66	VM6966	A	Shut-Off Lever Ass'y
67	VM9786	A	Retard & Clip Ass'y
68	VM6880	A	Retard Arm Spring
69	VM6713	A	Screw, #4-40 Hex Hd.
70	VM7125	A	Gear Ass'y
71	VM1588	A	"C" Washer
72	VM4172	A	Spring
73	VM5339	A	Pawl Lever
74	VM5338	A	Pawl Spring
75	VM2569	A	Trip Lever Ass'y
76	VM4656	A	Trip Link
77	VM1588	A	"C" Washer
78	VM7121	A	Slide Ass'y
79	VM2246	A	Slide Bearing Spring
80	VM2211	A	Slide Bearing
81			Screw, #6-32 x 1/2
82	VM6897	A	Record Support Shaft
83	VM6931	A	Record Support Guide Ass'y
84	VM4857	A	Screw, #6-32 x 3/8
85			Flat Washer
86			Screw, #6-32 x 1/4
87	VM14420	A	Ejector Bracket Ass'y
88	VM9823	A	Screw, #10-24 x 3/8
89	VM2585	A	Spring-Escape Lever
90	VM6947	A	Detent Spring
91	VM7434	A	Counter Balance Spring
92	VM7439	A	Idler Spring
93	VM7438	A	Idler Arm Ass'y
94	VM7437	A	Idler Link
95	VM1652	A	"C" Washer
96	VM7435	A	Idler Pulley
97	VM6631	A	Motor Mounting Grommet (3)
98	VM4923	A	Pivot Screw
99	VM4072	A	Hinge Arm Ass'y
100	VM7634	A	Lock Spring
101	VM7635	A	Lift Screw
102	VM14534	A	Hinge Spring
103			Jam Nut
104	VM14594	A	Tone Arm Adjusting Spring
105	VM4937	A	Safety Spring
106			Lockwasher
107	VM4339	A	Safety Plate
108	VM4327	A	Lift Pin
109	142-80	K, L	Pickup Cartridge (Powerpoint)
	142-83	O	Pickup Cartridge (Powerpoint Diamond-Sapphire)
	142-87	M, N, P	Pickup Cartridge (Special Zenith)
	142-88	M, N, P	Pickup Cartridge (Special Zenith)
	142-89	M, N, P	Pickup Cartridge (Special Zenith)
110	VM5022	A	"C" Washer
111	VM9134	A	Motor and Stud Ass'y
112			Fibre Washer
113	VM1652	A	"C" Washer
114	VM9133	A	Motor Plate Ass'y
115	VM7113	A	Reject Spring
116	VM2952	A	Fibre Washer
117	VM9510	A	Anti-Skate Spring
118	VM7120	A	Detent Spring and Link Ass'y

The PHOTOFACT Servicer

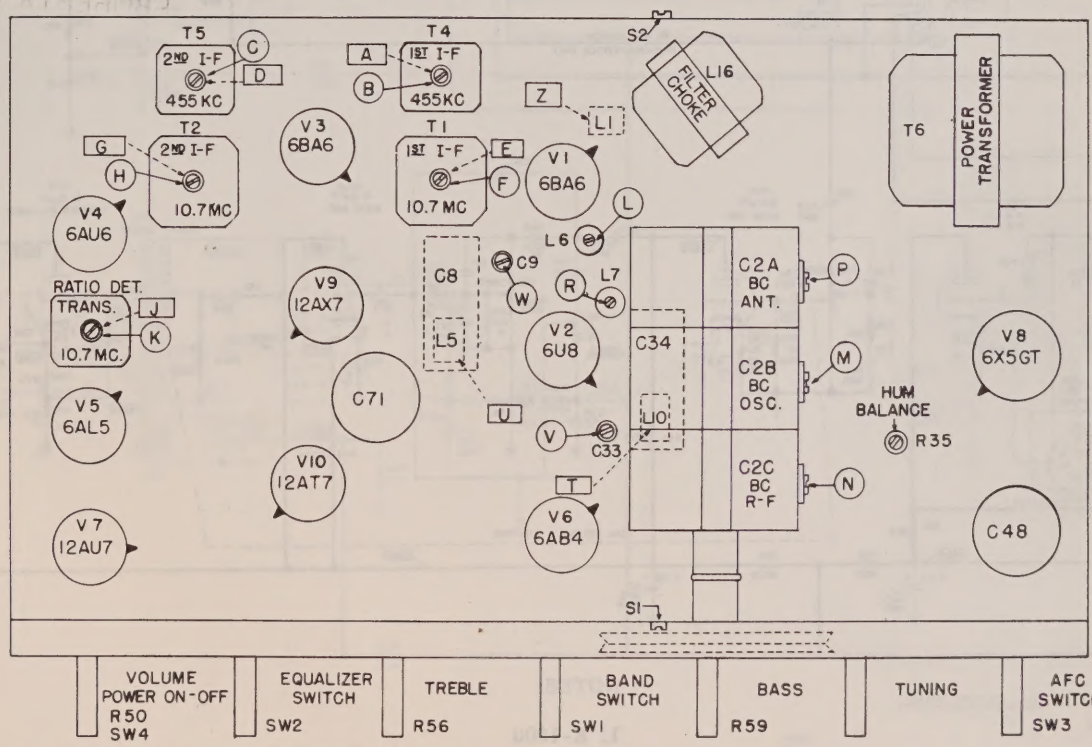
SET 392 ★ *Published for all users of Howard W. Sams' Photofact Folders* ★ MAR. 1, 1958

The service information in this Servicer provides data on models which we have been unable to present in PHOTOFACT Folders. The receivers are not in current production; a requirement for PHOTOFACT coverage, and we are therefore presenting schematics and supplementary data that will be of assistance when servicing these models.

CROSLEY MODELS G-200BD, G-200EY, G-200MY, G-200WT (G-200 SERIES)

DENVER, COLORADO
3924 MEADE ST.
L. F. BLANKENSHIP

TUBE LOCATION CHART
AM-FM TUNER 200 GT



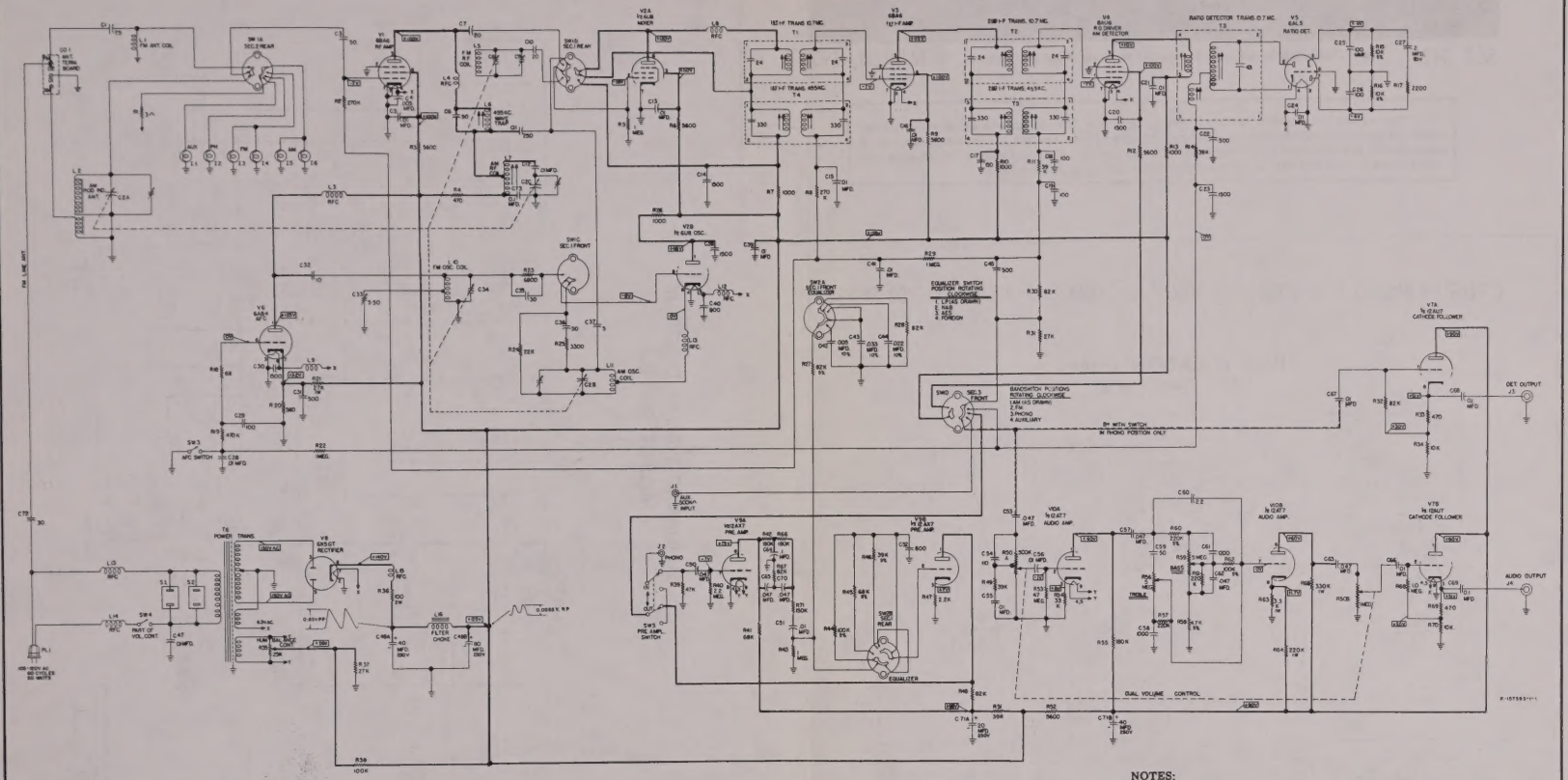
NOTE:

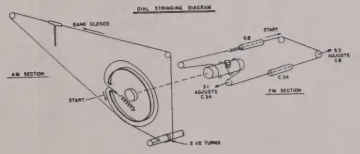
→ This symbol denotes alignment points on underside of chassis.

→ This symbol indicates alignment points above chassis.

SCHEMATIC WIRING DIAGRAM

AM-FM TUNER 200 GT



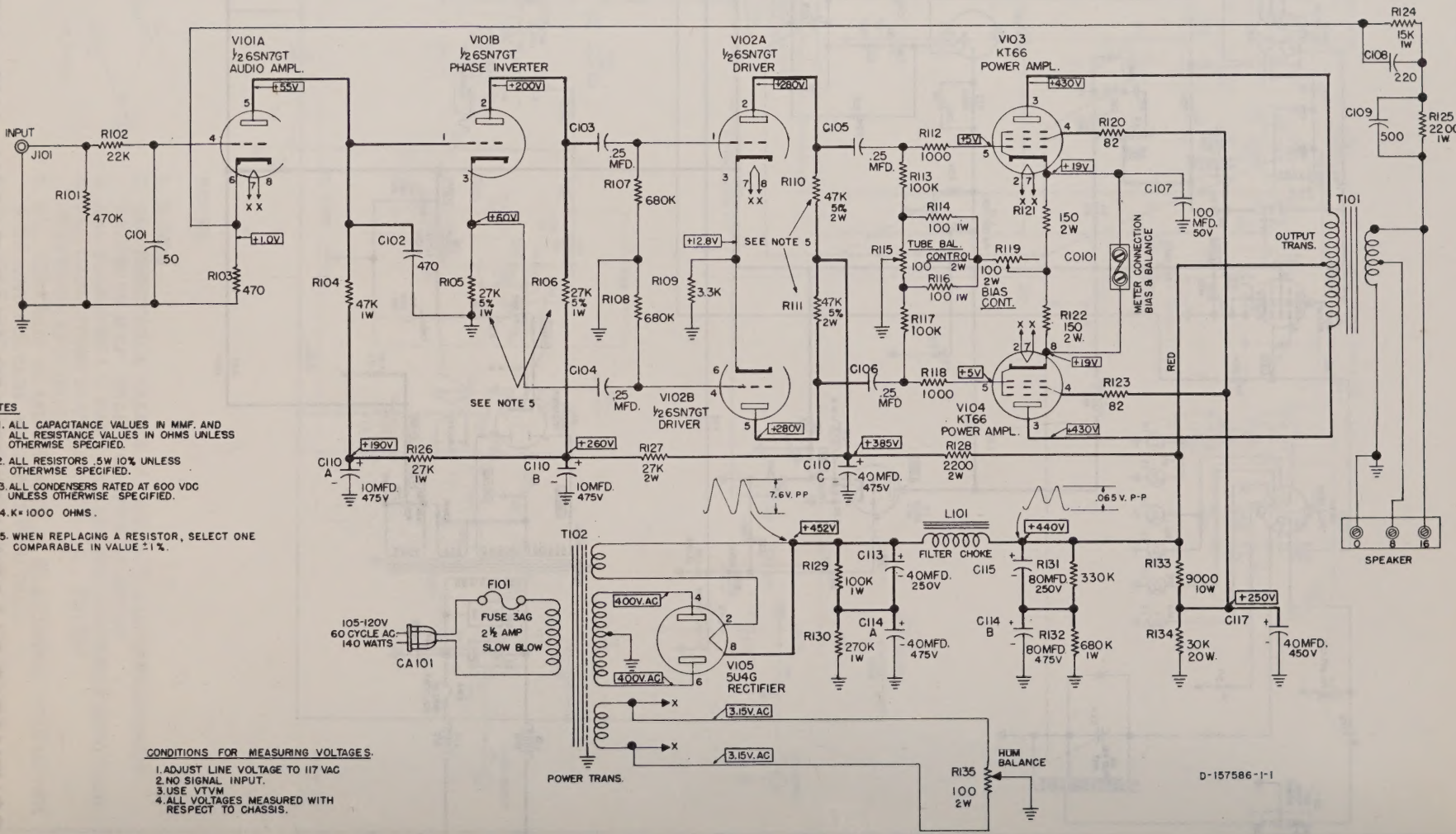


NOTES:

1. K-1000
2. ALL RESISTANCE VALUES IN OHMS AND ALL CAPACITANCE VALUES IN MMF. UNLESS OTHERWISE NOTED.
3. ALL RESISTORS 1/2 WATT, 10% UNLESS OTHERWISE SPECIFIED.
4. ALL CAPACITORS RATED AT 400V DC., UNLESS OTHERWISE SPECIFIED.
5. ALL VOLTAGES MEASURED WITH AN ELECTRONIC VOLTMETER WITH LINE VOLTAGE ADJUSTED TO 117VAC.
6. ALL VOLTAGES MEASURED WITH RESPECT TO CHASSIS GROUND WITH NO SIGNAL INPUT.

SCHEMATIC DIAGRAM COURTESY CROSLEY DIV. AVCO MFGR. CORP

SCHEMATIC WIRING DIAGRAM
AMPLIFIER 200 GA



NOTES

1. ALL CAPACITANCE VALUES IN MMF. AND ALL RESISTANCE VALUES IN OHMS UNLESS OTHERWISE SPECIFIED.
2. ALL RESISTORS .5W 10% UNLESS OTHERWISE SPECIFIED.
3. ALL CONDENSERS RATED AT 600 VDC UNLESS OTHERWISE SPECIFIED.
4. K = 1000 OHMS.
5. WHEN REPLACING A RESISTOR, SELECT ONE COMPARABLE IN VALUE ±1%.

CONDITIONS FOR MEASURING VOLTAGES.

1. ADJUST LINE VOLTAGE TO 117 VAC
2. NO SIGNAL INPUT.
3. USE VTVM
4. ALL VOLTAGES MEASURED WITH RESPECT TO CHASSIS.